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Building the Evidence Base on the Agricultural Nutrition Nexus: Vanuatu

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Building the Evidence Base on the Agriculture Nutrition Nexus: Vanuatu

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Dr Keith Galgal's co-authorship of this study report is acknowledged.

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Acronyms and abbreviations

ACIAR	Australian Centre for International Agriculture Research
AusAID	Australian Government Aid
BMI	Body Mass Index
BV	Biosecurity Vanuatu
CSO	Civil society organisation
CTA	Technical Centre for Agricultural and Rural Cooperation
DARD	Department of Agriculture and Rural Development
DCIR	Department of Customs and Inland Revenue
DCNVB	Department of Cooperatives and Ni-Vanuatu Business Development
DoET	Department of External Trades
DoI	Department of Industries
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FSA	Farmer Support Association
GDP	Gross domestic product
GIZ	German Agency for International Cooperation
GoV	Government of Vanuatu
IFAD	International Fund for Agricultural Development
MDG	Millennium development goals
NCD	Non-communicable diseases
NFNC	National Food and Nutrition Committee
NGO	Non-governmental organisation
NZAID	New Zealand Government Aid
OGCIO	Office of the Government Chief Information Officer

PAA	Priority action agenda
PEM	Protein-energy malnutrition
PIPSO	Pacific Islands Private Sector Organisation
RTC	Rural training centre
SAPV	Syndicat Agricole et Pastoral de Vanuatu
SPC	Secretariat of the Pacific Community
TRR	Telecommunication and radio regulator
VADB	Vanuatu Agriculture Development Bank
VARTC	Vanuatu Agriculture Research and Technical Centre
VFDP	Village Fisheries Development Programme
VNPAFS	Vanuatu National Plan of Action on Food and Nutrition Security
VPAFN	Vanuatu Plan of Action for Food and Nutrition
VPAFNS	Vanuatu Plan of Action on Food and Nutrition Security
UNICEF	United Nations Children's Fund
WHO	World Health Organization

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About the project

The project “Leveraging the Development of Local Food Crops and Fisheries Value Chains for Improved Nutrition and Sustainable Food Systems in the Pacific Islands with a focus on Fiji, Kiribati, Marshall Islands, Samoa, Solomon Islands, Tonga, and Vanuatu” is co-funded by the International Fund for Agricultural Development (IFAD) and the Technical Centre for Agricultural and Rural Cooperation (CTA) and is implemented in partnership with the Pacific Islands Private Sector Organisation (PIPSO). The goal is to strengthen the capacity of the Pacific Island governments, farmer and private sector organisations, and sub-regional institutions to develop strategies and programs – as well as mobilise financing – that can increase poor rural people’s access to nutritious and healthy food. CTA has overall responsibility for the implementation of the project.

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Executive summary

A rapid scan on the agriculture and nutrition situation in Vanuatu was undertaken in 2017 to build the evidence base for strengthening the linkage between two important sectors – agriculture and health, for improved food and nutrition outcomes.

The food and nutrition situation in Vanuatu has changed over the years as dietary patterns and lifestyles transitioned from a dependence on mostly subsistence living to a more urbanised western lifestyle. Since independence in the early 1980s, food crop production has not significantly increased although the population has almost doubled. In 1983 approximately 0.9 kg of food crops were produced and presumably consumed per capita per day compared to 0.5 kg in 2007. This has resulted in increased dependence on imported foods and the consumption of refined foods that contain higher levels of saturated fats and oils, salt and sugar; less physical activity and increased exposure to other risk factors linked to alcohol intake and smoking. Variation between the food and nutrition situation of rural and urban households and between rural households involved in cash cropping and in subsistence farming, and poor and more affluent urban households have been noted.

This study concurs with previous research findings that Vanuatu is dealing with a double burden of malnutrition; both over and under malnutrition. The negative impact of under nutrition is manifested in nutrient deficiency diseases such as anaemia (33.6%), iodine deficiency and stunting (26.8%) in children under five which remain a public health problem in Vanuatu. 11% of children (under 5) are also moderately or severely underweight and 5.8% are wasted (too thin for their height). Non-communicable diseases (NCDs), in particular cardiovascular diseases, diabetes, cancer and chronic respiratory diseases put a large burden on health and development in Vanuatu and are the leading cause of death (70%) and disability in the country. The Vanuatu 2013 report of the NCD risk factors STEPS survey found among the sample (≥4000) that the prevalence of obesity was 18.8%; hypertension was 28.6%, and raised blood glucose level was 21.2%. In all cases, men were more impacted than women. In addition, 58.2% of men and 65.0% of women were eating less than the recommended 5 servings of fruits and vegetables per average day.

This rapid scan has found evidence of well-intentioned agriculture and nutrition policies and plans as well as clearly stated indicators for determining agriculture, food and nutritional impact. The agriculture sector policy of Vanuatu 2015-2030 is underpinned by social, economic, ecological and cultural principles and sustainable development pillars. The policy is organised around 13 thematic areas and within them there is a national consensus on over 39 policy directives and 145 strategies. Thematic area number 10 under food security is specific to linking agriculture and nutrition, the specific objective of which is “food and nutrition security needs of Vanuatu adequately met by all stakeholders”. The following strategies have been identified:

1. Increase production of sufficient and nutritionally adequate food at national level;
2. Improve access to and availability of sufficient, safe and nutritionally adequate food;
3. Encourage the utilisation of sufficient and nutritionally balanced diets; and
4. Enhance the sustainability of food supply at national level.

The goal of Vanuatu’s first national food and nutrition policy (1986) was “to increase self-sufficiency through reduced consumption of imported foods” in response to the growing prevalence of NCDs at that time. This ambition was incorporated in the second national

development plan, which had as one of its stated objectives “to increase the contribution of locally grown staple foods in the diets of urban consumers”. These policies were complemented by two action plans:

1. Vanuatu Plan of Action for Food and Nutrition (VPAFN; 1997-2001); and
2. Vanuatu National Plan of Action on Food and Nutrition Security (VNPAFS: 2013-2015).

Both plans have emphasised the need for coordination and leadership to the successful implementation of government food security policies and plans. In VNPAFS (2013-2015), empowering consumers and mobilising industry partners and enhancing the sustainable production, processing, trading, marketing and use of safe and nutritious foods were also recognised as important. However, despite the well-articulated policies and plans, the rapid scan has identified that food insecurity and nutrition related diseases persist and are a burden on the national health and productivity and the future resilience of the society.

The Vanuatu food and nutrition problem is not simply linked to agricultural production, but also to knowledge and changing attitudes to the consumption of local food. A valuable lesson can be learned from the ambitious development programme for artisanal commercial fisheries at village level that was introduced by the government to give more priority to local fish products for local consumption. It was recognised that fishing and fish products play an important part in meeting the protein needs of the Vanuatu population; providing 16% to 18% of their yearly protein requirements. Imported fish products (mostly tinned fish) account for 32% to 35% of the fish supply. However, the policy objectives were commercially oriented, and priority was given to exporting overseas and urban and tourist markets. While very successful in developing the cash economy, expanding job opportunities and preventing urban drift, the income generated enabled families to increase expenditure on tinned fish as the fish was sold to the export and other markets.

Urgent action is needed to address the prevalence of malnutrition (in particular stunting, anaemia, iodine deficiency and NCDs; hypertension, diabetes, obesity and heart failure), and improve production and consumption of affordable local foods within the changing context of agriculture and agricultural markets and trade in Vanuatu. Lessons from four case studies for improving production of local nutritious foods, diversifying production and training the next generation of farmers and agri-entrepreneurs and recommendations for overcoming institutional barriers to coordinated action are made. The challenge now is to devise agricultural and agri-business programmes that retain the important benefits for improving nutrition and health and, at the same time, arrest the decline in agriculture and fisheries and improve rural livelihoods.

Next steps for linking agriculture interventions with food and nutrition outcomes for Vanuatu are proposed.

Introduction

The 2007 national nutrition survey showed that 8.3% of children under 5 years of age were severely stunted, 26.3% moderately stunted and 10.4% were moderately anaemic. The same survey showed that iron deficiency anaemia among reproductive women was also high at 20.9% and an anaemic mother would not be able to adequately nurture her child and family.

Unhealthy diets are associated with lifestyle diseases such as heart diseases, some cancers, high blood pressure and diabetes. Eating fruits and vegetables has been shown to improve health outcomes. However, the Vanuatu STEPS 2011 results showed that 61.8% of adults are not eating enough fruits and vegetables for health. In addition to this, nearly 20% (18.8%) of adults are obese (BMI ≥ 30 kg/m^2), 28.6% have high blood pressure and receiving medication and 21.2% have diabetes and receiving medication.

Health and nutrition status are important prerequisites for national development. Healthy people are more productive and will have the capacity to build a healthy nation. It is essential that people not only have access to enough food, but the food needs to be nutritious to sustain healthy lifestyles.

CTA is specifically interested in collecting detailed information on the agriculture and food and nutrition situation in Vanuatu where malnutrition (over and under nutrition) is prevalent to determine the entry points which provide the greatest opportunity for strengthening the agriculture-nutrition nexus. Evidence on policies, programmes and interventions of the national government and other key actors and their effectiveness and impact as well as existing capacities in Vanuatu would be useful in guiding future investments.

The objectives of this assignment were to:

- Undertake a rapid scan of related policies and programmes/interventions, including the identification of major actors and target groups, in–country competencies in nutrition linked to addressing the food and nutrition security situation as well as the agriculture-nutrition nexus to learn lessons for formulating guidelines for improving food and nutrition security outcomes and strengthening the agriculture-nutrition nexus; and
- To document and share the lessons learned with policy makers, researchers, farmers and other key stakeholders.

The study included the collection, review and synthesis of secondary information and key informant interviews to provide an overview of the state of food and nutrition security, the communities most at risk of malnutrition and related underlying causes, key statistics on the situation, various agricultural/nutrition initiatives, the main actors and target beneficiaries (especially women and young children under five) and their impact (potential or realised) on agricultural productivity, incomes, food, nutrition and health outcomes.

About Vanuatu

Location: Vanuatu is a small island nation situated in the South Pacific Ocean. It is an archipelago comprised of 83 small and young volcanic and coral platform islands in a 'Y" shaped chain stretched over 1,300 km along a north–south axis between latitudes 130^0 and 220^0 between Fiji and New Caledonia (see Figure 1).

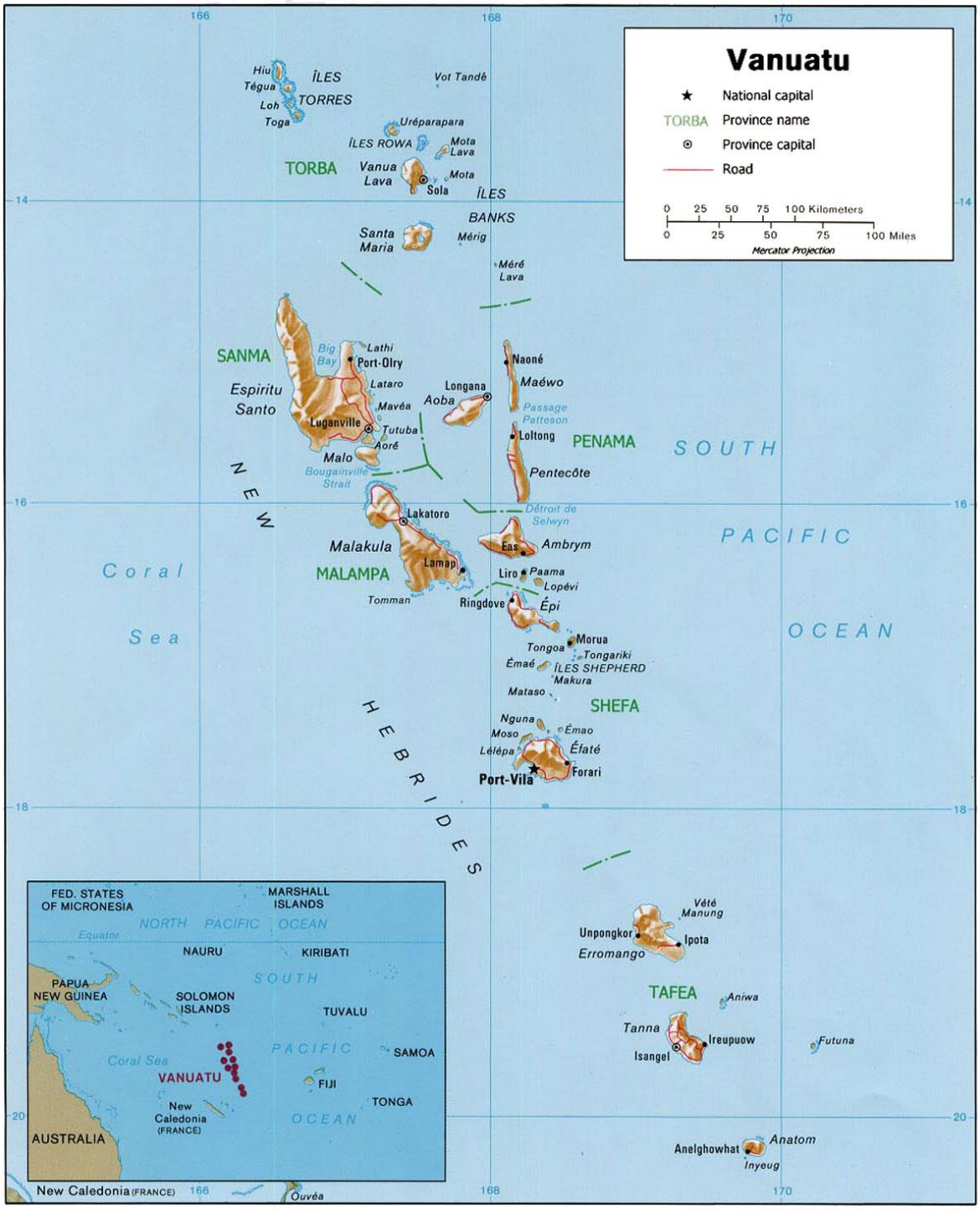

Figure 1. Map of Republic of Vanuatu

(Source: Nations Online Project – http://www.nationsonline.org/oneworld/map/vanuatu-map.htm)

Geography: The islands are rugged with mountainous terrains and are prone to frequent cyclone, seismic and volcanic activity. There are nine active volcanoes, seven of which are terrestrial and two under sea. Because of the rugged and mountainous terrain most of the population live on the narrow coastal strip.

Climate: Tropical; moderated by southeast trade winds from May to October; moderate rainfall from November to April; maybe affected by cyclones from December to April.

Area: 2,266 km^2 and an exclusive economic zone of 700,000 km^2.

Population: 265,000 people with 76% living in rural areas, mainly by subsistence.

Population growth: Average 2.2% per annum: rural areas 1.9% and urban areas 3.6%. Urban population is increasing by about 2,060 people a year and the rural population by about 3,360 a year.

Natural resources: Manganese, agriculture, hardwood forest, and fish. The country has a reasonable natural resource base, particularly fisheries and forestry for achieving sustainable development. There is increasing 'formal' economic activity in all of the islands. An estimated 41% of the land is suitable for cultivation, but this varies considerably from island to island.

Land tenure: Over 90% of the land is held in customary land tenure for use by family members while the remaining 10% is leasehold and public land.

Accessibility: The large sea area and many islands combined with rough island terrain often make travel and communication between and within islands very difficult and expensive. All of the main islands are linked by air, but some remote ones can only be reached by boat.

Languages: Vanuatu has three official languages – English, French, and Bislama, a creole language derived from English. Bislama is the first language of many urban ni-Vanuatu, that is, the residents of Port Vila and Luganville. It is the most common second language elsewhere in the Vanuatu islands. In addition, there are 113 local (indigenous) languages spread over the archipelago.

Literacy rate: Overall = 84%; male = 84.9%; female = 81.6% and age 15 and over can read and write.

School life expectancy (primary to tertiary education)**:** Overall = 11 years; male: 11 years; female: 10 years.

Education expenditures: 5% of GDP.

Ethnic groups: ni-Vanuatu 97.6%, part ni-Vanuatu 1.1%, other 1.3% (2009 est.).

Religions: Protestant 70% (includes Presbyterian 27.9%, Anglican 15.1%, Seventh Day Adventist 12.5%, Assemblies of God 4.7%, Church of Christ 4.5%, Neil Thomas Ministry 3.1%, and Apostolic 2.2%), Roman Catholic 12.4%, customary beliefs 3.7% (including Jon Frum cargo cult), other 12.6%, none 1.1%, unspecified 0.2%.

Demography: 0-14 years: 37.3% (male 50,810/female 48,753); 15-24 years: 19.8% (male 26,341/female 26,620); 25-54 years: 34.2% (male 44,732/female 46,545); 55-64 years: 5% (male 6,751/female 6,599); 65 years and over: 3.7% (male 5,020/female 4,766) (2014 est.) Median age: total: 21.1 years; male: 20.7 years; female: 21.4 years.

Economy: Vanuatu's economy is growing slowly with a GDP growth estimated at 3.3% annually. Much of the economic growth is supported by the significant aid programme assistance received by the government from development partners through donor-funded projects and programmes implemented by line ministries. Activities in the primary sector, which include agriculture, forestry and fishing, have also made significant contributions (22.4% of the GDP).

- GDP: US$ 828 million
- GDP growth: 3.3%
- GDP per capita: US$ 4,800
- GDP composition by sector: agriculture 22.4%, industry 9.7%, and services 67.9%
- Labour force by occupation: agriculture 65%, services 30%, industry 5%
- Land use: arable land 2.5%, permanent crops 7.5%, other 90%
- Agricultural products: copra, beef, vegetables, fruit, kava, cocoa, taro, yams
- Major industries: food and fish processing, wood processing, tourism
- Industry production growth rate: 4.8%
- Natural resources: forests, inshore and offshore fisheries, limited silver and other minerals
- Export commodities: copra, timber, beef, cocoa, kava, coffee
- Export revenue: US$ 43.1 million (2013)
- Major export partners: EU 33%, Japan 23%, US 12%, other Asian 10%
- Import value: US$ 319.4 million
- Import commodities: machineries, foodstuff and fuel
- Import partners: China 20.2%, Singapore 18.8%, US 15%, Japan 11.6%, Australia 10.4%, Fiji 5.2%, New Zealand 4.8% (2012)

Currency: Vatu (Vt), Vt 100 = US$ 1.053 (in 2017).

Life expectancy at birth: 72.72 years; male: 71.16 years; female: 74.36 years.

Infant mortality rate: Total = 16.41 deaths/1,000 live births; male: 17.53 deaths/1,000 live births; female: 15.23 deaths/1,000 live births.

Total fertility rate: 3.36 children born/woman.

Status of food and nutrition security

Food and nutrition security is essentially a household or individual having access to and eating enough safe and nutritious food. As noted in the framework for action on food security in the Pacific[1], "food security is achieved when all people at all times have sufficient, safe and nutritious food. Access to sufficient, safe and nutritious food depends on the availability of healthy food (is there healthy food to eat?), accessibility of healthy food (can it be purchased or grown?), stability (are there risks of losing access to healthy food due to economic or environmental shocks?) and the use of food (can the food be used to meet dietary requirements, i.e. is it nutritious?), and health needs (is it safe and are healthier choices preferred?). These factors are in turn influenced by the multiple sectors, groups and environments that affect food supply and demand".

As far back as 1991 there have been numerous research and situation analyses into food security and dietary deficiencies in Vanuatu. It was found that food insecurity was more related to '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.

The food and nutrition situation in Vanuatu has changed over the years. The last 20 years has seen a gradual decline in the consumption of local foods in both rural and urban areas. This is mainly due to a decline in production of local foods in the rural areas. This not only poses a huge problem with food security in the country but also food self-sufficiency in households particularly in rural areas.

Vanuatu's dietary pattern has changed over the years with changes in lifestyles, which used to be mostly subsistence to a more western lifestyle with growing urbanisation. This has resulted in a dramatic increase in the dependence on imported foods, in particular increased consumption of refined foods, saturated fats and oils, alcohol, less physical activities and other risk factors such as smoking. It is evident that a significant variation in food and nutrition security status of households exists in Vanuatu between:

- Urban and rural households;
- Rural households involved in cash cropping and those practicing a more traditional subsistence lifestyle; and
- Poor and more affluent urban households.

Urban household food and nutrition security is dependent upon securing access to income and food at affordable prices. Any adverse changes in income flows or food prices can have serious implications for household food and nutrition security. The vulnerability of urban household food and nutrition security varies directly with their socio-economic status – the poor are clearly and always the most vulnerable because their principle wage earner's income is low. Poor households spend a greater proportion of their income on food and so are more vulnerable to increases in food prices. Poor households have a lower propensity to save and so do not have reserves to draw against periods of interrupted income.

[1] Towards a food secure Pacific: Framework for action on food security in the Pacific 2010.

Any factor that reduces the household's access to food of adequate quality places it in potential food and nutrition insecurity. For example:

- For those reliant upon subsistence food supply – any interruption in food production from natural disasters such as cyclones; and
- For those dependent upon purchased foods – any reduction in the ability to buy food such as rising prices or loss of job.

Vanuatu is dealing with a double burden of malnutrition (over and under nutrition) due to unhealthy diets. The negative impact of both under nutrition (from not eating enough safe and nutritious foods) leading to nutrition deficiency related illnesses such as anaemia (iron deficiency) and goitre (iodine deficiency) and over nutrition (from eating too much food which are usually high in salt, sugar and fat) leading to lifestyle diseases such as diabetes, heart diseases, some cancers and obesity have contributed to the increasing burden of NCDs in Vanuatu.

In Vanuatu, the majority of the population (76%) lives in the rural areas and is engaged in rural subsistence agriculture. However, most of the agricultural activities are geared towards generating additional household income through sales in local markets (producing estimated annual income of 8,277 million Vatu (Vanuatu 2006 household income and expenditure survey report[2]) as well as towards penetrating niche markets for high value organically grown food products such as copra, beef, cocoa, kava and coffee, contributing to 21% of the GDP.

The focus on improving economic development through increasing agricultural production and productivity for export must be managed properly to ensure that food security is not compromised. This would also include improving the domestic market for agricultural products supported by improved transport services, both inter-island and intra-island.

The 2006 HIES report showed that at the national level, food expenditure was estimated at 14,025 million Vatu (US$ 14,768 million) annually, representing 49% of all expenditure: about half of all household spending in Vanuatu was for food. The data collected in the survey was also used to estimate the food and basic needs poverty lines for two urban centres (Port Vila and Luganville) and rural areas. For the food poverty line, the results indicated that on average every person needed 102 Vatu per day to have enough food to meet essential nutritional requirements and that 7% of the population were not spending enough money to acquire a basic nutritious diet. The report also noted that the incidence of food poverty was highest in rural areas with 7% of rural population experiencing food poverty, but this could be due to under-reporting of the consumption of what they produced. It nonetheless highlighted the need to be vigilant in ensuring food security systems in rural areas is improved and maintained. It also highlights the need for more robust indicators for determining household food poverty.

Food production also is dependent on availability and accessibility to land. Only one third of the total cultivable land is presently farmed[3]. Land tenure issues have been identified as a major barrier to improving primary sector development. Climate change is also threatening food security in Vanuatu as noted earlier, affecting local food production.

[2] Vanuatu 2006 HIES report. https://vnso.gov.vu/index.php/component/advlisting/?view=download&fileId=2003
[3] Vanuatu government (2012): Priority action agenda.

Pathways linking agriculture to nutrition

Vanuatu is experiencing rapid social and economic changes. These have caused fundamental shifts in agricultural resource allocation and food consumption patterns. Two factors in particular are responsible for linking agriculture to nutrition in Vanuatu.

(i) Rapid population growth and urbanisation; and
(ii) Increasing commercialisation of subsistence agriculture.

Rapid population growth and urbanisation

Infectious diseases were the major cause of death in Vanuatu (and in all Pacific Island countries) before becoming independent as a nation in 1980. Population growth was low and more than 85% of the people lived in rural remote islands of the archipelago and depended heavily on subsistence agriculture – traditional root/tuber crops, green leafy vegetables, nuts and tropical fruits, and fisheries for their livelihood. Urban centres were small and mostly occupied by colonial administration workers. Main employers of the ni-Vanuatu were copra plantations and the colonial administration. Food was imported to feed administration workers and their families and plantation workers where plantation owners imported large volumes of rice and tinned fish/meat. NCD prevalence was either low or non-existent.

Changes in mortality patterns began in the 1960s in Polynesian countries (Nauru, Guam, Cook Islands and Fiji) as these countries became westernised quickly and were developing ahead of their Melanesian neighbours (Vanuatu, Solomon Islands and Papua New Guinea). In the 1980s, the most prominent public health problems in Vanuatu were skin and chest infections, malaria and diarrhoea, and NCDs were not yet major problems among ni-Vanuatu[4]. A general change from infectious diseases to NCDs has been associated with increased development, urbanisation, monetarisation and education.

In view of the increasing prevalence of NCDs experienced through the Pacific and increasing urbanisation and westernisation in Vanuatu, the Vanuatu government undertook a dietary and NCD survey in 1985 to gather baseline epidemiological data upon which preventive programmes could be based. Rapid urbanisation has reduced the rural population from 87% in the early 1980s to 82% in 1989 and to 76% currently.

Increasing commercialisation of subsistence agriculture

Traditional rural economic activity of the ni-Vanuatu household's subsistence farming was primarily based on root crops (taro, yams, cassava, sweet potato) and plantains. However, this has changed when plantation-based cash cropping was introduced by the colonial administration, and an urban economy was created. Both cash crops and the urban economy were largely controlled by expatriates. This expatriate economy was integrated with the world economy where prices of export commodities were controlled by world market prices, while the smallholder and subsistence agriculture practiced by ni-Vanuatu remained under funded and virtually ignored. Since independence, cash crop production, mainly copra plantations, has largely passed into the hands of smallholders but the urban economy is still dominated by expatriates.

[4] Vanuatu health department, 1986. Morbidity of outpatients in Vanuatu.

The Vanuatu economy remains dualistic with the urban economy primarily based on trade and tourism and the rural economy on agriculture.

Increased commercialisation (cash cropping and commercial food crop production for household income) has changed agricultural practices, resource allocation and food consumption patterns in ni-Vanuatu rural households, particularly when the commodity prices are good. Farmers shift their labour from subsistence food production to cash cropping to benefit from the high commodity prices. Increased consumption of imported food in rural and urban areas as a result of increased income has affected the nutritional status of ni-Vanuatu and household food and nutrition security[5].

This was clearly evident in 1983 when the copra price was good. Total rural household cash expenditure for food was 64% (34% on rice, 17% on tinned fish and meat, 10% on bread and 10% on sugar)[6]. In the same period, expenditure on imported foods in rural areas accounted for approximately 78% of the total expenditure on food. Consequently, obesity dietary deficiencies, malnutrition (over nutrition and under nutrition) started to emerge. Prevalence of NCDs was not significant in Vanuatu except in Port Vila which had a lower incidence compared to other Pacific Island countries.

For the majority of the rural households, copra, cocoa, kava and cattle are the main commercial agricultural commodities and source of income. A potential challenge to household food and nutrition security is land. Population growth is putting pressure on arable land resources available for food production, especially in areas that are already less well endowed.

Vanuatu's potential to be self-sufficient in food no longer provides a guarantee of accessing safe and nutritious foods. Between 1980 and 1990, food imports on average represented 19.8% of the value of total imports and 79.7% of the value of total exports[7]. In some years food imports were worth more than the total value of exports despite Vanuatu's physical ability to be food self-sufficient. It is inevitable that the increasing number of poor urban households will continue to require the supply of cheap imported foods for their food and nutrition security.

[5] Foy, T.J. (1991). Situation analysis of household food security in Vanuatu. Department of Agriculture, Livestock and Horticulture, Port Vila.
[6] Mackenzie-Reur, V.L. (1987) Health and nutrition trends in Vanuatu. Proceedings of Vanuatu National Food and Nutrition Policy Workshop. 2-4 June 1987. Port Vila, Vanuatu.
[7] Foy, T. J. (1991). Situation of Household Food Security in Vanuatu, Department of Agriculture, Livestock and Horticulture. Port Vila.

The changing context of agriculture and nutrition in Vanuatu

Land resources

Vanuatu's total land area is 1,223,178 hectares of which only 492,177 hectares is good agricultural land, representing only 40% of the total area or 10.4 hectares per household. More than 90% of the land is customarily held land while about 10% is government owned or leased land on which there is an opportunity for strategically increasing production. Nonetheless, only one third of the cultivable customary land area is presently being farmed[8].

Vanuatu agriculture sector and the national economy

Vanuatu's economy is largely based on tourism, trade and agriculture. Although agriculture contributes less to the GDP than the service sector (trade and tourism), agriculture remains the principal economic activity and source for the vast majority of ni-Vanuatu. Agricultural products also accounted for over 75% of the value of domestic exports. GDP contribution by agriculture declined from 26% in 1983 to 22% in recent years. The total proportional contribution by the plantation subsector has fallen considerably since 1983. The only subsectors to have strengthened since 1983 are subsistence agriculture and forestry[9].

Agricultural subsectors

Vanuatu's agriculture sector is divided into three distinctive subsectors, with the subsistence sector accounting for more than 75% of the total agriculture production. The semi-commercial subsector based on commercial food crops production contributes 15% and is growing into an emerging vegetable market[7], while the declining commercial subsector based on a limited range of traditional cash crops contribution is 10% of the total production in the sector.

a) Subsistence agriculture

The subsistence subsector is predominantly centred on root crops (taro, yam, cassava and sweet potato) for consumption and cultural purposes (e.g. ceremonies) and characterised by a total reliance on rain irrigation and rudimentary tools. Subsistence agriculture is labour intensive, but utilises completely organic farming practices.

b) Semi-commercial agriculture

The bulk of semi-commercial agricultural activities is concentrated near urban centres where high population growth rates, the development of the tourism industry, and high rates of urban unemployment are able to sustain a growing agricultural market for food crops. Recently, there has been an expansion in the production of green leafy vegetables in diets complementing the popular open pollinated local island cabbage (*Abelmoscuhus manihot*), including varieties of hybrid Chinese cabbages (*Brassica rapa L. chinensis*), tomatoes (*Lycopersicon esculentum*), capsicum and eggplant (*Solanum melongena*). Spice and herb cultivation in this subsector is a new but promising industry being led by women farmers, with potential for engagement by other vulnerable groups. Currently, there is high demand in the domestic market for vegetables and other short-term crops (to supply a growing tourism sector) and this is causing a notable shift in

[8] Vanuatu government (2012), Priority action agenda.
[9] UNICEF Vanuatu government (1991). A situation analysis of children and women in Vanuatu.

agricultural crops produced. These short-term crops are also beneficial for addressing food insecurity and other risks associated with traditional longer growing crops.

c) Commercial agriculture

The commercial subsector is dominated by four main cash crops: 24% of ni-Vanuatu households engaged in cocoa production, 50% in kava, 2% in coffee and 69% in coconut. The 2009 population census noted two other emerging cash crops, namely pepper and vanilla in which 1.5% and 15% of households were engaged[10]. While there has been a slight increase in the number of households growing coffee, the census also registered a significant drop in the number of households planting kava, coconut and cocoa. Such a decline may be related to fluctuations in world commodity prices, emerging markets for novel crops, loss of basic farming skills/knowledge or conversion of prime agricultural land near urban areas into residential estates to cater for rapidly expanding urban populations.

Copra and cocoa are mainly produced by smallholder farming households. Decrease in export volume and smallholder revenue base is due to a combination of declining world prices and destruction of crops by cyclones. Copra is Vanuatu's main agricultural export commodity outweighing the contribution of cocoa and kava. However, cyclones over the years had caused significant damage to copra as well as cocoa. Despite being dominant, there is a general observation that in all the major copra producing islands, coconut rehabilitation programmes have remained stagnant over the last 30 years with only a very small percentage of farmers engaging in coconut replanting programmes.

Over the last 10 years, world prices for cocoa have greatly increased and on the domestic market the demand for kava has remained very high. The production of kava is still very high while cocoa is on the decline over the last 10 years. The local consumption of kava is considered to be on the rise, although a definitive figure has never been given to this market sector.

Diversification away from copra and cocoa and into other commercial crops and livestock has been slow. The most important of these are beef, kava, food crops, vanilla, saddle wood and to a lesser extent honey. Despite Vanuatu government's agriculture policy to diversify the agricultural production base, production is not yet significant enough to offset the decline in copra and cocoa's contribution to the country's GDP and most importantly the farming households source of income and food and nutrition security.

Primary sector contribution to GDP

The combined primary sector contribution to GDP accounted for 20% compared to the service sector which contributes around 69%[11]. Vanuatu's industry sector currently only contributes about 10% to GDP. Figure 2 below presents the composition of primary sector contribution to GDP in 2012: Fisheries contributed 6%; forestry 9%; livestock 8%; agriculture 75% and others 2%[12]. The primary sector has potential for expansion (since the contribution of the manufacturing sector is only 5%[13] with a current utility capacity of only 50%.) It is observed however, that in terms of gross national product (GNP), the agriculture sector is actually

[10] Vanuatu government. (2009). Census report, Port Vila.
[11] Vanuatu government. (2011). National industry policy.
[12] Vanuatu government. (2010). Millennium development goals 2010 report.
[13] Vanuatu government. (2011). Micro, small and medium enterprise policy.

contributing more than is commonly portrayed[14]. This is demonstrated by the capacity in which farmers and fishermen are able to produce regardless of whether it is for market or subsistence food and nutrition.

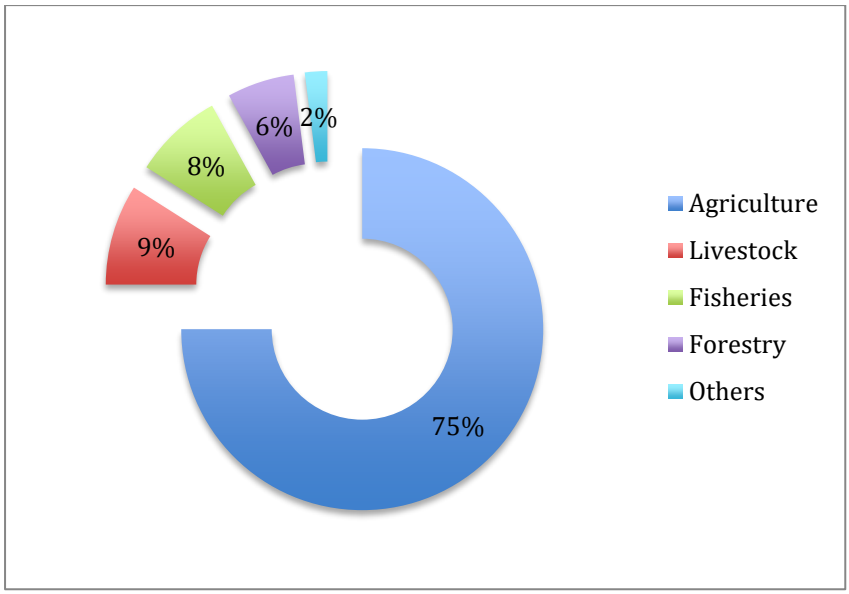

Figure 2. Primary sector contribution to Vanuatu's GDP by sector
Source: Reserve Bank of Vanuatu (from Vanuatu Agriculture policy).

Food production and poverty

Since independence in the early 1980s, food crop production has not significantly increased while the population has almost doubled. This is evident in the daily per capita production and consumption of local food crops. In 1983, approximately 0.9 kg of food crops were produced and presumably consumed per capita per day compared to 0.5 kg in 2007. On the other hand, the imports of rice doubled between the early 1990s and 2007. It is unlikely that there will be any significant improvements in food and nutrition security based on domestic food crop production at any time in the near future, unless there will be a paradigm shift in policy and investment climates.

In 2007, the agriculture census found that nationally, 82% of all households engaged in some form of agriculture. Most households (70%) practiced shifting cultivation, 60% practiced intercropping of temporary crops. Only 13% of these households used what could be considered modern techniques such as applying fertiliser, pesticides or improved seeds[15]. This indicates that there is considerable potential to increase food and nutrition security through local food crop production which could then either be consumed by households or provide a source of cash income which could then be used to purchase imported foods such as rice and tinned fish and other basic household needs. This however does not resolve the problem of the high cost of local food and traditional root crops such as taro, yam and manioc compared to imported foods and the ability of households without access to a 'free' source of these traditional food crops to purchase them at more expensive market prices when imported foods are much cheaper.

[14] Vanuatu government. (2011). National adaptation programme action.
[15] Vanuatu National Statistics Office, census of agriculture 2007, Vanuatu.

The 2009 National Food Summit found that in terms of local food production, food and nutrition security was seen as compromised by the low perceived status of those who farm and fish in 'modern' Vanuatu and the subsequent need to encourage young people to get involved in agricultural production and marketing activities as well as the need for better support for farming and fishing industries by identifying better ways to process and market local foods. Local foods have to be processed and packaged so that they can compete directly with imported foods in terms of convenience to prepare and consume.

Vanuatu's economy is based on agriculture and tourism in which 80% of the population depends entirely on subsistence agriculture for their food and nutrition security and wellbeing. Although the other 20% reside in the urban areas, most would still rely on agricultural products from market centres for their daily source of nutrients. With a population growth rate of 2.3%, Vanuatu is amongst the countries with the highest population growth rates in the world. On the rapidly urbanising island of Efate, the population growth rate is 3.7%. The 2009 census shows that despite a 30.1% increase in the total number of households from 1999, there has been a considerable decline in the number of households actively engaged in the major cash crop agriculture[16]. Decline in production is also related to factors such as landlessness, lack of improved farming technologies, soil infertility, climate vulnerable varieties of crops and difficulties associated with accessing credit.

A 2006 comparative assessment of poverty for 13 Pacific Island countries placed Vanuatu at 5.6% basic needs poverty line making it the lowest in the region[17]. In 2010, the MDG progress report for Vanuatu identified that 4% of the population earned only $1 per day, while 16% of the population are living below the national poverty line[18]. In 2006, 5.4% of children were found to be living below the $ 1.25 poverty line.

The government strategy for alleviating the proportion of the population living under poverty is expressed in the vision of the overarching productive sector policy which states that "through substantial increase in primary production, processing and value adding there will be good jobs and income for a very significant number of ni-Vanuatu"[19].

Inconsistent production impacts adversely on per capita income and regularity of food supply. The MDG report for Vanuatu in 2010 noted that in rural areas there is evidence of nutrient deficiencies in people's diets and in the urban areas, a shift away from traditional nutritional crops to imported processed food[20] consequently resulting in increased cases of lifestyle diseases (including obesity, diabetes, hypertension, heart attacks, strokes and many other NCDs). Currently, NCDs are the main cause of premature death among adults in Vanuatu. Disabilities and premature deaths caused by these diseases are occurring among the economically productive members of the population, tremendously straining public health care systems.

[16] Vanuatu government (2009), 2009 census report.
[17] Vanuatu government (2016), agriculture sector policy.
[18] Vanuatu government (2010), millennium development goals 2010 report.
[19] Vanuatu government (2012), overarching productive sector policy.
[20] Vanuatu government (2012), overarching productive sector policy.

Constraints to food production

Agricultural technology

Most agricultural production in Vanuatu is based on the use of rudimentary hand tools, contributing to low and irregular production, although increasing productivity of short term economically viable root crops has been demonstrated with animal assisted and mechanised agricultural implements (e.g. doubling output).

Expanding into new cash crop markets requires increased knowledge, improved farming skills and a consistent supply of sufficient seeds and planting materials to sustain production. Research fieldwork conducted by the Vanuatu Agriculture Research and Technical Centre (VARTC) and locally based researchers into varieties of taro and yam on major producing islands have found that Vanuatu is facing conservation and genetic improvement issues[21]. If taro and yam are promoted as cash crops, the loss of genetic diversity may become a barrier for increasing production.

Climate change effect

Vanuatu's weather is characterised by a dry cool season from May to October and a wet hot season from November to April (also cyclone season). Out of the total number of tropical storms affecting Vanuatu over the last 49 years, 36% contained hurricane force winds, 23% storm force wind and 20% gale force winds[22]. The probability of being struck by hurricane force winds every year is very high for Vanuatu. Storm damage to crops and critical infrastructure requires strong collaboration among various stakeholders involved in the area of disaster risk management and reduction.

Prolonged (and/or shortened) wet seasons produce conditions favourable for pests and diseases harmful to plant production and crop harvesting and become the causes of concern for food and nutrition security and Vanuatu's socio-economic wellbeing. In the same manner, prolonged dry seasons are causing plant stress leading to reduced production. Traditional adaptation capacity is high, although traditional knowledge and risk reduction practices are generally being lost.

Vanuatu's inability to increase and sustain agricultural production is exacerbated by the negative effects of climate change and climate variability. With temperatures increasing, seasonal rainfall patterns shifting, and extreme events more frequent and severe, the incidence of heat, water, pest/disease and soil fertility stress is drastically hampering already risk prone production. While agricultural climate adaptation programmes are now widespread (e.g. via SPC-GIZ, the World Bank, and others) there is still a severe deficit in climate knowledge, information, technology and implementation for vulnerable farmers.

Access to credit

Changing climatic conditions, frequent natural hazards and the poor transportation of agricultural produce from rural areas to markets in the main urban centres (due to poor road conditions, deteriorating wharfs and jetties, and inconsistent shipping routes) have implications for farmer accessibility to credit. Financial institutions in Vanuatu regard funding for agricultural

[21] Vanuatu government. (2012). Trade policy framework.
[22] Vanuatu government. (2012). Vanuatu national statistics office.

value chain development as high-risk investment and do not regard it as a potential and profitable market.

This is reflected in the amount of credit approved by the Vanuatu Agriculture Development Bank (VADB) in 2008, for farm development which was 33% of the total applications and 55% less than for cattle development. Of the portion of credit granted to agricultural initiatives, a large percentage was intended for investment in traditional cash crop (copra, kava and cocoa).

Agricultural policy

Main constraints and issues

Main constraints and issues identified for the current agricultural policy to address are:

1. Absence of an appropriate policy for the agriculture sector

The agriculture sector currently does not reflect the diverse interests and aspirations of all agricultural stakeholders resulting in the inability for stakeholders to collaborate to effectively manage or expand the sector.

2. Difficulties for access to trade and marketing opportunities

Limited opportunities for the trading and marketing of agricultural products results in a lack of motivation for farmers to meet market demands.

3. Diversification of food and cash crops

A lack of capacity for diversification in food and cash crop varieties (in the traditional and subsistence subsector) and a heavy reliance on a narrow range of crop varieties in the semi-subsistence sector results in food insecurity and low per capita income from cash crops.

4. High cost of shipping

High costs associated with the transportation of products to main market centres and inconsistencies in the shipping industry result in a loss of confidence and interest in the agriculture sector as a preferred sector for investment.

5. Lack of proper infrastructure

Poor conditions of existing infrastructure and lack of investment in additional infrastructure that is placed in economically strategic locations results in high costs associated with marketing of produce further resulting in low production.

6. Limited collaboration among government stakeholders

Poor collaboration and coordination among relevant government stakeholders (on service provision, local infrastructure, domestic market opportunities like tourism) results in over dependence on export markets.

7. Low level of input by private sector and civil society

Low level of contribution and participation by private sector and civil society for empowering the agriculture sector results in loss of popular confidence in the sector.

8. Limited access to financial institutions

Very few financial institutions make credit available for supporting farmers thus the private sector loses motivation towards farming business endeavours.

9. Ineffective coordination of farmer activities

Very weak coordination of farmer activities and farming specialties amongst farmer associations (combined with a lack of capacity for coordination from DARD and DCNVB) results in an inability to meet the production demands of domestic and export markets.

10. Lack of competent authority for promoting commodities

Failure of some government authorities to take responsibility for identifying new market opportunities resulting in an over reliance on a narrow range of traditional cash crops and limited opportunities for expanding income and revenue generation in the agriculture sector.

11. Inability to adequately engage Vanuatu's youth in farming activities

Increased youth urbanisation in recent years is related to the perception that agriculture is not the most desirable occupation further resulting in a loss of traditional agricultural knowledge and a decline in stock of local varieties of food crops.

12. Prevalence of poor farming practices

Low farm productivity often results from a combination of factors such as poor farming practices and reduced time spent and labour dedicated to farming activities.

13. The gradual decline in number of farmers

Low levels of overall productivity due to factors such as the declining number of households engaged in farming activities and a lack of interest in farming among educated youth.

14. Lack of information for accessing credit

Difficulties associated with accessing credit for agricultural activities results in insufficient investment in agricultural business enterprises.

15. Inability to expand business enterprise

Lack of management, financing and marketing skills results in minimal expansion of existing and new agricultural business enterprises.

16. Land disputes

The high frequency and likelihood of land disputes and tenure insecurity results in low use of good agricultural land and lack of long-term investment.

17. Loss of prime agriculture land

Lack of land use planning by competent and authorised institutions results in the increased use of good farmlands for residential, tourism and industrial purposes.

Vanuatu's agriculture sector policy is underpinned by social, economic, ecological and cultural principles and sustainable development pillars. With lessons learned from past policies, the goal of the current 2015-2030 agriculture policy is *"The nation's agricultural resources are managed in an integrated and sustainable manner to provide food and improved incomes as well as contribute to environmental and social services to enhance wellbeing of all people in Vanuatu".*

The policy is organised around 13 thematic areas: Two thematic areas, namely research & development and production & market access, support all sustainable development pillars. The social pillar is directly addressed in the thematic areas of institutional setup, capacity building, and gender & vulnerable groups. The issues of economic development are covered in the thematic areas of finance, investment & employment, and market access. The thematic areas that contain environmental issues include land use, planting materials, environmental protection & sustainable farming and climate variability, climate change & disaster risk management.

Within these thematic areas, the policy contains a national consensus on over 39 policy directives and 145 strategies with the view that if properly and cooperatively implemented, the agriculture sector would be substantially more resilient and able to:

- Generate additional employment within the formal sector;
- Increase GDP;
- Supply nutritional food sources;
- Adapt to climate change; and
- Provide for lasting and culturally founded livelihood security for the people of Vanuatu.

Policy linking agriculture and nutrition

Thematic area specific to linking agriculture and nutrition is thematic area number 10 under food security:

Specific objective: *Food and nutrition security needs of Vanuatu adequately met by all stakeholders.*

Policy directives:

Increase production of sufficient and nutritionally adequate food at national level

- Mass produce sufficient and nutritionally adequate food for domestic consumption (farmers, industries, DARD, NGOs, CSO, provinces, development partners);
- Make available planting materials for high nutritional food crops (DARD, VARTC, NGOs, farmers, provinces, CSO, development partners);
- Provide funding to support food security policies, strategies and activities (GoV, DARD, health, development partners).

Improve access to and availability of sufficient, safe and nutritionally adequate food

- Facilitate distribution of sufficient, safe and nutritionally adequate traditional foods to disadvantaged groups (CSO, NGOs, DARD, health, VARTC, provinces, development partners);

- Reduce price of nutritionally adequate food products (industries, farmers, DARD, DoI, provinces, development partners).

Encourage the utilisation of sufficient and nutritionally balanced diets

- Facilitate the utilisation of nutritionally balanced diets through awareness and distribution (DARD, health, provinces, NGOs, CSO, development partners);
- Encourage consumption of locally produced foods and discourage utilisation of imported foodstuffs (health, DARD, DoET, DCIR, BV, food centre, media, NGOs, CSO, development partners);
- Develop appropriate means to enhance consumption of locally produced foods.

Enhance the sustainability of food supply at national level

- Promote traditional and modern food preservation knowledge and technologies to sustain food needs (health, DARD, food centre, media, NGOs, CSO, development partners);
- Provide awareness on the importance of sustaining food supply (health, DARD, food centre, education, NGOs, CSO, farmers, provinces, development partners);
- Practice water irrigation to improve the productivity of farming systems (DARD, farmers, industries, NGO, development partners).

Fishing and fish products play an important part in the protein content of the Vanuatu population's diet, providing 16% to 18% of their yearly protein requirements. Imported fish products (mostly tinned fish) account for 32% to 35% of the fish supply. In order to give more priority to local fish products to enhance the protein supply, the Government introduced an ambitious development programme for artisanal commercial fisheries at village level. The development of small-scale commercial fisheries has been one of the priorities in the first two Five Year Development Plans (1982-1986, 1987-1991). This policy was implemented in 1982 with the introduction of a development programme for commercial village fisheries: Village Fisheries Development Programme (VFDP).

The main purpose of the VFDP was to develop commercial fisheries at village level. The objectives were:

1. To improve the nutrition of rural and urban dwellers;
2. To reduce the imports of tinned fish;
3. To develop the cash economy in village communities;
4. To create employment opportunities and cut down the urban drift into Port Vila.

These policy objectives were commercially oriented, and priority was given to exporting overseas and supplying the urban and tourist markets with species of fish with high commercial value. For island economies, this activity would result in cash generated from sale of fish in the capital Port Vila, which in turn would lead to the development of associated commercial activities and provide employment for the rural population. There was demand from overseas markets for the type of species marketed and this very successful venture was providing opportunity for development of cash economy and preventing urban drift through employment opportunity. The nutrition objective was not met because the fishing was entirely geared to the outside market with no direct contribution to improving nutrition of rural population from fisheries

development. However, the income generated enabled families to increase their food expenditure and thus significantly compensate for the lack of commercial supply of fresh fish.

Undoubtedly, imported tinned fish was one of the products that benefited the most from the increase of available demand. Therefore, the fourth objective of the VFDP to reduce the imports of tinned fish was not achieved.

Government positions for agriculture sector development

Vanuatu government's position for sector development stated in the current agriculture policy are:

1. Inclusive development

    - Any financial and technical assistance provided by development partners to the agriculture and horticulture should be to achieve the ultimate goals of this policy;

    - Any NGO and other civil society groups doing work to assist communities improve their livelihood through agriculture and horticulture will do so to fulfil the policy objectives of this policy, the overarching productive sector policy and all other relevant productive sector policies promoting agriculture.

2. Priorities for development partners assistance

    - Any national, provincial or community project and programme envisaged for agriculture and rural development shall have in it components directly related to issues of climate change and risk reduction and that the process of project endorsement and approval shall be done collaboratively between the department of agriculture and rural development and the authorities responsible for climate change;

    - In the implementation process of such projects both authorities (climate change and department of agriculture and rural development) shall collaboratively monitor and evaluate its outcomes;

    - Any development partners funding allocated to agriculture development shall also include elements of climate change crop adaptation to extreme/variable climate conditions and the strengthening of risk resilience.

3. Research and development

    - All research activities undertaken in the agriculture sector of Vanuatu should be linked into development programmes in agriculture;

    - While the government prioritises the introduction of climate and risk resilient crops for cultivations by farmers, all stakeholders must ensure that Vanuatu does not lose those crops that are endemically suited to the environments of the country;

    - Increased sociocultural research is required to understand how society is affected by and influences agricultural development in Vanuatu.

4. Mechanisation and mass production

   - Vanuatu seeks to increase its capacity of agricultural production and thus the sustainable use of mechanisation in production should be viewed as a possible way forward in agriculture development;

   - The public service of Vanuatu must increase the number of agricultural extension officers in the rural areas to reflect the level of demand for agriculture services.

5. Support to farmers

   - The Ministry of Finance responsible for the collection of revenue must make additional and sufficient budget and funds available for assisting farmers;

   - There should be strong and active producer cooperatives or associations formed to ensure that the interests of farmers and smallholders are represented in policy, decision making and allocation of support;

   - The ministry embraces information and communication technology as an enabler and utilise it to inform farmers on their agricultural needs further capitalising universal access policy market development initiatives for community learning centres, with support from the Office of the Government Chief Information Officer (OGCIO) and TRR.

6. Food security and agriculture cluster

   - In all food security projects, there should be equal and balanced consideration for introduced species as well as traditionally farmed species;

   - Nutrition and physical activity are crucial factors in the prevention and control of NCDs and so all activities related to food security should also ensure nutrition security;

   - There will be a food security and agriculture cluster led by the department of agriculture and rural development, with provincial focal points, to coordinate and monitor programmes and issues related to food security, climate change and natural disasters.

Nutrition policy

National food and nutrition policy (1986)

The first Vanuatu national food and nutrition policy was drafted in 1984 by the National Food and Nutrition Committee (NFNC) that was set up following the 1983 National Nutrition Survey and the recommendations of the national nutrition workshop held in October of the same year. The NFNC was made up of representatives from various government departments and non-government agencies. The policy was approved in 1986 by the council of ministers. The role of the NFNC was to facilitate the implementation and monitoring of the national food and nutrition policy.

The 1983 National Nutrition Survey report[23] raised concerns about increasing prevalence of NCDs associated with increased consumption of imported processed and refined foods high in

[23] Hung, M. 1983. National Nutrition Survey Report. Department of Health, Port Vila, Government of the Republic of Vanuatu.

fat, sugar and salt, and rising foreign exchange cost. The perceived understanding besides wasteful use of scarce foreign exchange was that imported foods are inferior to locally produced foods and in some cases imported foods are harmful to human health. Reducing consumption of imported foods consequently became the objective of Vanuatu's food policy entitled "Nutrition and Food Self-Sufficiency".

The Nutrition and Food Self-Sufficiency policy was incorporated into the Second National Development Plan (1987 to 1991)[24]. The objectives set by this second development plan were:

- Reduce and stabilise the proportion of cash income spent on imported foods in both urban and rural areas;
- Increase the contribution of locally grown staple foods to urban consumers' diets;
- Maintain the existing contribution of locally produced foods in the diet of rural people; and
- Improve household food security and disaster preparedness.

To achieve the above objectives the following strategies were outlined:

- Promote agricultural policies seeking a balance between cash and food crop development;
- Promote nutritionally varied and balanced diets through nutrition and health education; and
- Implement tariff and non-tariff barriers on selected imported foods.

Thus, primarily the national food policy objective was clearly "increased self-sufficiency through reduced consumption of imported foods". The dilemma faced by the policy makers was to what extent it is possible to strike a balance between the needs of national level food policy and the household needs, as increasing urbanisation was likely to increase demand for imported foods.

Besides emphasis on reduced consumption of imported foods, the policy also placed priority on preparedness for natural disasters (cyclones). The wider nature and concept of food and nutrition security has been missed. The efficacy of the proposed strategies in terms of increasing food self-sufficiency would have been misleading. Furthermore, the imposition of tariffs on certain foods was harmful to households' food accessibility.

The implementation of agricultural policies such as intercropping, which attempted to stimulate farmers/households to develop dual agricultural systems for food and cash crop production did not reduce consumption of purchased imported foods. These foods are purchased and eaten in rural areas because households wish to and have the income to allow them to do so. It is not a result of households lacking access to local foods.

The policy relating to nutrition education may have been effective in checking the inroads made by imported foods in the diet of consumers whose food expenditure patterns are dictated by non-price factors. The dietary pattern in poor urban households is simply determined by their disposable income. These households are simply unable to afford more varied and nutritious traditional food sources that are dearer than imported 2-minute noodles, rice and flour.

A 25% tariff policy on imported rice was first introduced in 1987 in a direct effort to discourage its consumption. However, this policy did not have any significant impact on the consumption of rice and so was reduced to 12% in 1991 because (i) the tariff caused the price of rice to increase; and (ii) the price elasticity of demand for rice varied between households according to

[24] Republic of Vanuatu (1987) National Development Plan II (1987–1991), Port Vila, Vanuatu.

the ease with which rice can be substituted with alternative/local foods. In rural areas substitutes for rice are readily and freely available, allowing households to reduce their purchases of rice and switch back to local foods with relative ease. Higher prices engineered by the tariff reduced the consumption of rice with no adverse effect on rural household food security. For urban households the situation is different. Their price elasticity is lower than that of rural households and inelastic amongst the poorest urban settlers.

It is clear that some attempts have been made to address the current and future nutritional problems in Vanuatu by the development of a national food and nutrition policy in the years following the 1983 National Nutritional Survey. Although the NFNC is charged to overseeing the implementation of the policy, further policy initiatives in health, agriculture and community development are necessary and a more detailed planning of strategies to achieve policy objectives is essential. The major immediate needs appear to be relevant nutrition and health education to families and communities, and the development of adequate support networks for mothers in both rural and urban areas. The NFNC must take a more active role in initiating future policy developments, and planning and coordinating strategies to achieve policy objectives if the problems of malnutrition and NCD prevalence are going to be adequately addressed.

Vanuatu Plan of Action for Food and Nutrition (1997-2001)

Proceeding from the National Food and Nutrition Policy of 1986 and support of the fourth National Development Plan, the overarching goal of Vanuatu Plan of Action for Food and Nutrition (VPAFN; 1997-2001) is to have a population of ni-Vanuatu who are nutritionally healthy and have access to nutritionally adequate safe food. The specific objectives were to:

1. Prevent under nutrition and prevent its prevalence in the population, with specific emphasis on improving the nutritional status of those most at risks, e.g. infants and pre-school children, pregnant and lactating women;
2. Reduce or at least prevent an increase in prevalence of nutrition related disorders, e.g. obesity, hypertension and diabetes;
3. Increase food self-sufficiency and reduce dependence on imported foods and beverages, in particular those which are inductive of nutrition related disorders;
4. Improve household food security;
5. Improve availability of nutritious and safe foods; and
6. Enhance disaster preparedness.

Targets for VPAFN were to:

1. Reduce the prevalence of underweight children in the 1-2 years age group, by at least 10% compared to the 1996 national nutrition survey levels;
2. Promote breastfeeding in urban areas and prevent the decline in rural areas;
3. Reduce the prevalence of iron deficiency anaemia by pregnant women by at least 20% of the 1996 level;

4. Reduce or control the prevalence of obesity, hypertension and diabetes in adult population by at least 10% of the 1996 levels;
5. Decrease or control the dependency on food imports per capita of population by 10%; and
6. Reduce by 10% the proportion of all foods available for consumption whether domestic or not which are unsuitable for consumption.

To achieve the goal, objectives and targets of the VPAFN, a number of strategies were identified:

1. Food and nutrition planning

   Policy makers, programme planners and implementors from various sectors and levels of government to mainstream nutritional outcome and wellbeing of the target population groups as a key development outcome.

2. Human resource development

   Upskill existing manpower from various government departments and sectors to manage the plan at the national level from planning to implementation.

3. Employment of curative and preventive approach

   Ensure that extremely malnourished cases are treated and rehabilitated in hospitals and nutrition fares and prevent them from dying through:

- Growth monitoring and promotion of all new-borns until they are 2 years old.
- Promotion of exclusive breastfeeding until the infant is 4 to 6 months of age and breastfeeding is replaced with nutritious supplementary foods.
- Nutritional care and counselling of pregnant and lactating women on nutritionally adequate and safe diets during pregnancy and lactation and taking iron supplements from mid-pregnancy to delivery, as well as the prevention of malaria.

The VPAFN was to have been implemented between 1997 and 2001. The plan attempted to integrate and consolidate all key players including various government sectors, private sectors, NGOs, international partners and donor agencies to contribute to eradicate hunger and malnutrition and deliver quality of life for ni-Vanuatu.

Vanuatu National Plan of Action on Food and Nutrition Security (2013-2015)

a) Development of Vanuatu Plan of Action on Food and Nutrition Security

The development of VPAFNS was recommended in 2009 at the inaugural Vanuatu National Food Summit held in Port Vila and attended by key ministries, NGOs, Port Vila municipal council as well as the private sector representatives in response to the emerging issue of food security precipitated by rising global food prices and climate change, which was posing to be a real threat to the future wellbeing of the people of Vanuatu. However, since the 2009 National Summit little progress was made to implement the recommendations from the summit. Then in 2012, the Ministry of Health with assistance from the World Health Organization (WHO) convened a one-day multisectoral stakeholder workshop to progress the recommendations from the 2009 National Summit.

Thus, the VPAFNS adopts the vision and goals outlined in the Regional Framework of Action on Food Security in the Pacific (conceptual model shown in Figure 3 below) as they also captured the governments long-term goal of a healthy and wealthy Vanuatu. The strategic objectives and actions are specific to the Vanuatu situation and based on the recommendations from the 2009 National Food Summit and the 2012 multisectoral stakeholder consultation workshop.

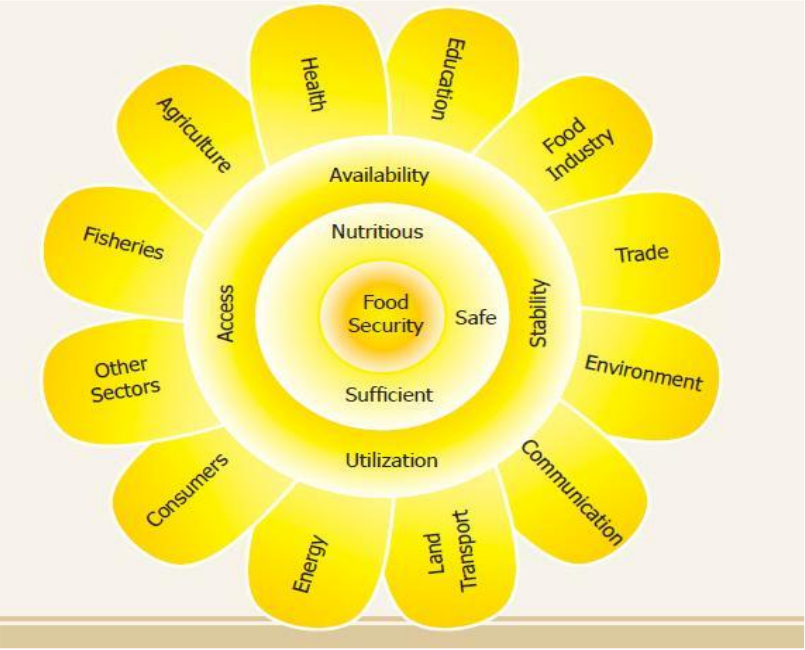

Figure 3. Conceptual model for food security in the Pacific

(Source: Towards a food secure Pacific: A framework for action on food security in the Pacific, 2010).

Purpose of the plan was to organise all concerted efforts and responses from government sectors, civil society and development partners to work collaboratively at national, provincial and community levels to ensure a food secure Vanuatu. The plan called for a strong leadership to coordinate and advocate for a strong political commitment at the highest level to support the implementation of recommended actions. The plan was also to:

1. Communicate to national leaders and policy makers the need for a long term formal government policy to address the threat of food insecurity on national development; and

2. Securing funding support from development partners whose agendas include improving food security and national development.

Coordination and leadership is an essential element for the success of implementation of government policies and plans, so this action plan also serves as a tool to guide the coordination of efforts to address food security in Vanuatu.

The National Plan of Action outlines a holistic approach to address all key elements of food security along the food chain from farm to fork, i.e. from primary production, processing, trading, marketing, preparation and consumption. Investing in improving and increasing production and productivity of the agricultural and fisheries sectors was emphasised and aligned to the overall government's primary sector development and the environment.

Multiple stakeholders were consulted and participated in the development of the plan which is multisectoral in reflecting the need for multisectoral approaches and interventions.

b) Vision of VPAFNS

A food secure Vanuatu, where every ni-Vanuatu has physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.

c) Goal

To strengthen and improve the key elements of food security:

1. *Availability of food.* Is there sufficient healthy food to eat?
2. *Access to food.* Can healthy food be purchased (affordable) or grown?
3. *Stability of food systems.* Are there risks of economic (food price surges) and environmental (climate variability) shocks that jeopardise healthy food availability and access all the time?
4. *Food utilisation.* Can the food be used to meet dietary (is it nutritious?) and health (is it safe?) needs?

d) Strategic objectives

The strategic objectives of VPAFNS are (based on the six thematic areas for action identified in the 2009 National Summit):

1. *To improve and strengthen leadership and coordination of food security activities;* Leadership and coordination were identified as a priority area for action during the 2009 National Food Summit to address food security and ensure a food secure Vanuatu. It requires all its key sectors to implement government policies and plans. The multisectoral dimensions of food security require a robust coordination mechanism involving multiple sectors and actors that is supported by stable leadership.

2. *To strengthen food security information systems particularly the monitoring and research capacity;* Developing the monitoring and evaluation framework for the National Plan of Action was identified as a priority by VPAFNS, and so developing the monitoring and evaluation framework for the action plan is a key action under this objective. Availability of relevant information from multiple sources in a timely manner is needed for making good decisions. Therefore, capacity building of nationals in the area of monitoring and evaluation to improve food security and vulnerability is important to build and use existing tools and survey data to provide better evidence to inform policy decision making processes.

3. *To empower consumers and mobilise industry partners to make informed decisions;* Engaging food industry partners to raise awareness of their contribution to promoting and protecting consumer health through production, trading and marketing of healthy food options is an important action under this objective. Healthy food choices need to be made available, affordable, accessible and acceptable to consumers.

4. *To enhance the sustainable production, processing, trading, marketing and use of safe and nutritious foods;* The government of Vanuatu acknowledged the importance of

strengthening and increasing productivity and production of the primary sector (agriculture and fisheries sectors) for the domestic market to strengthen national food security and reduce dependence on food imports. Recommended actions under this objective focus on strengthening and improving primary sector production and productivity as well as strengthening the intersect between health and trade to improve the availability, accessibility and stability of healthy imported foods. Taking a 'farm to fork' approach addresses the multiple dimensions of food security along the food chain from production through to the end user.

5. *To strengthen regulatory frameworks, enforcement and compliance activities and public-private sector collaborations;* Collaboration between public and private sectors is important for the formulation and implementation of regulatory frameworks that not only promote fair trading of food but also protect consumers by ensuring the minimum standards of the nutrition quality and safety of foods being marketed are maintained. In an environment of increasing dependence on imported foods, there is a lack of food regulations in place to ensure compliance with minimum requirements for food safety and quality standards. Food control systems need to be strengthened in order to facilitate trade and protect consumers from poor quality and unsafe foods. Enforcement of legislations also needs strengthening. Food businesses also need support to implement voluntary measures to improve the nutrition profile of their products through reformulation or other means to ensure available food is safe and nutritious to eat.

6. *To protect infants and vulnerable populations;* Infants, young children and women are the most vulnerable population groups in Vanuatu. Protecting those most vulnerable from the adverse impacts of food insecurity is especially important given the high dependency of these groups on others for food and survival. The millennium development goals recognised the importance of protecting the poor, women and children. Effective actions must take into account the needs of those most susceptible to food insecurity.

The timeframe for implementing these recommendations and strategic objectives was limited to three years from 2013 to 2015 and is based on the government's planning timeframe. However, to effectively address food security with the participation of multiple stakeholders, the recommended actions need to be maintained for the longer term.

Key strategic partners and actors – Public (national and international), private sector, donors and international technical agencies, NGOs

The government of Vanuatu has a vision for an educated, healthy and wealthy ni-Vanuatu and ensuring a food secure Vanuatu can contribute significantly towards achieving this vision. This needs to be supported by a stable and consistent policy environment, appropriate rules and regulations and adequate funding of programmes to support and promote development.

However, in recent years, changes in government and consequent lack of political stability has led to frequent policy shifts and inconsistency in policy formulation, analysis and application, contributing to lack of progress towards achieving the vision of an educated, healthy and wealthy Vanuatu. The inconsistency in having clear leadership at the highest level has also contributed to lack of progress in addressing food security.

Although food security was not explicitly identified as a government priority in the government's priority and actions agenda 2006-2015[25], it nonetheless acknowledged that there was considerable scope for strengthening and increasing the primary sector productivity and production for the domestic market to strengthen national food security and reduce dependence on food imports.

The millennium development goals 2010 report for Vanuatu[26] identified food security is a problem contributing to extreme hunger and highlighted the same challenges that were identified previously. It also noted that it was unlikely that the government will meet its target for eradicating extreme hunger and that the policy environment in this area is weak.

Key public sector actors of the government of the Republic of Vanuatu are:

1. The department of agriculture, livestock and horticulture
2. The public health department
3. National planning and statistical office
4. Office of disaster and climate change
5. The department of education

The Vanuatu government has recognised the contribution made by key strategic partners for research, data collection, monitoring and situation analysis on health, food and nutrition security and wellbeing of the people of Vanuatu. There is a wealth of information and data available that point to key policy directions for government policy makers and planners to make good decisions to invest in food and nutrition intervention programmes and activities. Vanuatu is one of the very few countries in the Pacific that has clearly identified indicators for agriculture, food and nutritional impact.

Key strategic partners who have in the past and are now assisting Vanuatu with its food and nutrition security policy and implementation plans are listed below.

[25] Priority and Action Agenda (PAA) 2006-2015. Department of Economic and Sector Planning, Ministry of Finance and Economic Management. June 2006.
[26] Vanuatu Government. (2010). Millennium Development Goals 2010 for Vanuatu, Prime Minister's Office, Port Vila.

1. Donors and development partners (governments of Australia, France, Japan, Germany, New Zealand, European Union);
2. International technical agencies (CTA, WHO, UNICEF, FAO, IFAD, ACIAR, SPC);
3. NGOs (Oxfam, FSA); and
4. Private sector organisations and business community of Vanuatu.

Nutrition capacity including communicating key messages

Nutrition posters, leaflets and booklets have been continuously developed by the nutrition and health promotion section of the department of health. Nutrition messages targeting the general public have focused on the utilisation of local foods, breastfeeding, eating well-balanced diets and the establishments of home gardens for household consumption as well as how to prevent lifestyle diseases. These materials have been disseminated widely through the existing network of the health system and are being promoted during annual events such as national health week, world health day, world breastfeeding week, world food day, and diabetes day. However, these efforts have not brought about the intended impact due to some technical problems in the development of the messages.

Recognising the value of nutrition, the curriculum development centre of the department of education undertook the integration of health and nutrition in the agriculture curricula. This was made possible through the assistance of the relevant sectors. However, since the teaching of such a curriculum is not compulsory, they may or may have not been used in primary and secondary education.

Agricultural sector support should also include education programmes about the importance of child (and maternal) health and nutrition as well as how to have a balanced diet with enough vitamins, proteins and micronutrients based around subsistence and crop gardens in rural areas with the reintroduction of kitchen garden promotion activities in urban and peri urban areas; even introducing community gardens in some areas.

Food marketing systems

In Vanuatu, most of the agricultural activities are geared toward generating additional household income through sales in local markets as well as towards penetrating niche markets for high value organically grown food products such as copra, beef, cocoa, kava and coffee.

The food marketing system in Vanuatu can be classified into four main categories: Village local rural markets, island local rural markets, urban domestic markets and export markets.

Village local rural markets

A village local rural market is an informal local market or markets based mostly in or near rural villages. In these informal markets a range of local food items and other products are traded 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). Increasing quantities of import trade store items are also traded here.

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 organised 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.

Island local rural markets

On many islands in Vanuatu, marketing opportunities for local foodstuff 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 on the same day.

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 local 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 bulky and less perishable 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.

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.

Food consumption patterns

Food consumption patterns in Vanuatu have changed over time. Figures to 8 below show the outcomes of a dietary study from 1985 (SPC, 1993) of three population groups at different stages of westernisation: urban (Port Vila), intermediate (Nguna Island – accessible to Port Vila) and rural group (villages from Middle Bush, Tanna Island) concluded that dietary changes accompanied westernisation. A greater intake of imported foodstuffs and an overall decrease in nutritional quality of the ni-Vanuatu diet was the result (see Figures 5 and 8). Energy intake and intake of vitamins and minerals was also lowered. For urban and intermediate males, the age-adjusted mean daily intakes of thiamine, riboflavin and niacin were below recommended levels (see Figure 6). With westernisation, the percentage of energy provided by carbohydrates was reduced, more refined carbohydrates were consumed and therefore, a decrease in fibre intake was likely. Fat provided a greater percentage of the total energy intake and animal fat consumption increased (see Figure 7). A higher proportion of people used sugar, salt and sauce. The frequency and quantity of alcohol consumption increased. However, easier access to animal protein had the positive effect of larger intakes of protein of higher biological value and of more easily absorbed iron.

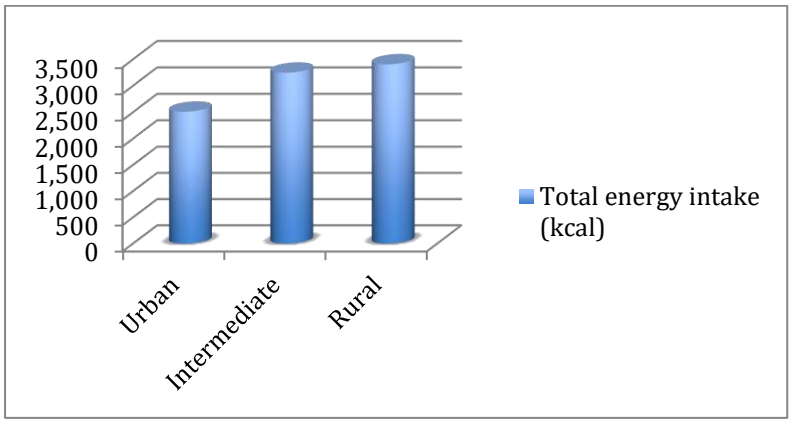

Figure 4. Total energy intake by males in three population groups in Vanuatu

(Data source: SPC (1985) Vanuatu dietary study).

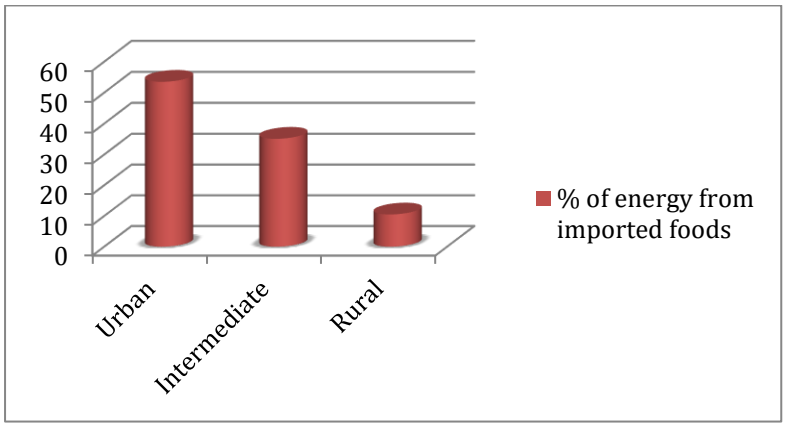

Figure 5. Percentage of energy from imported foods consumed daily by males in three population groups in Vanuatu

(Data source: SPC (1985) Vanuatu dietary study).

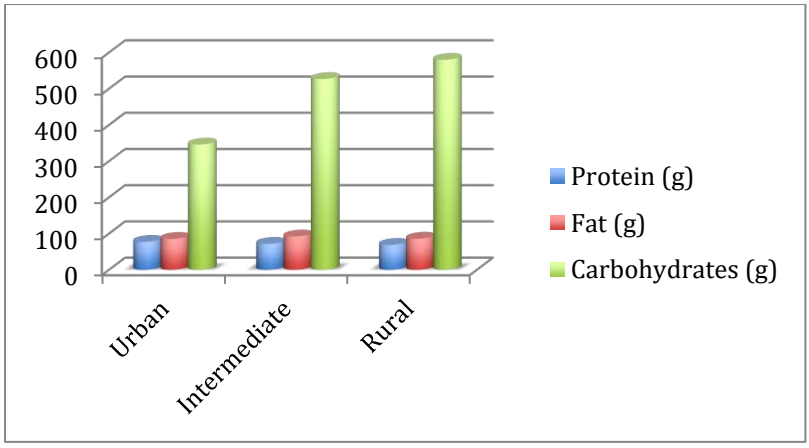

Figure 6. Daily intake of protein, fat and carbohydrates by males in three population groups in Vanuatu

(Data source: SPC (1985). Vanuatu dietary study).

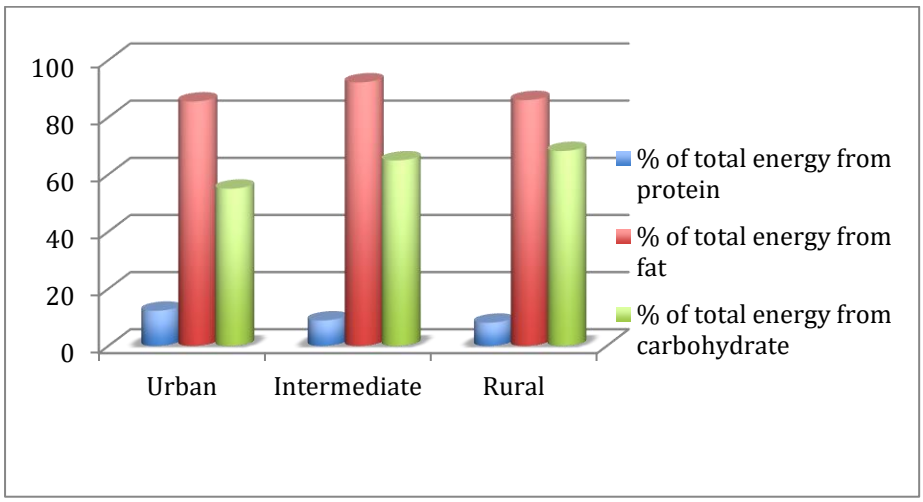

Figure 7. Percentage of total energy from protein, fat and carbohydrates consumed daily by males in three population groups in Vanuatu

(Data source: SPC (1985). Vanuatu dietary study).

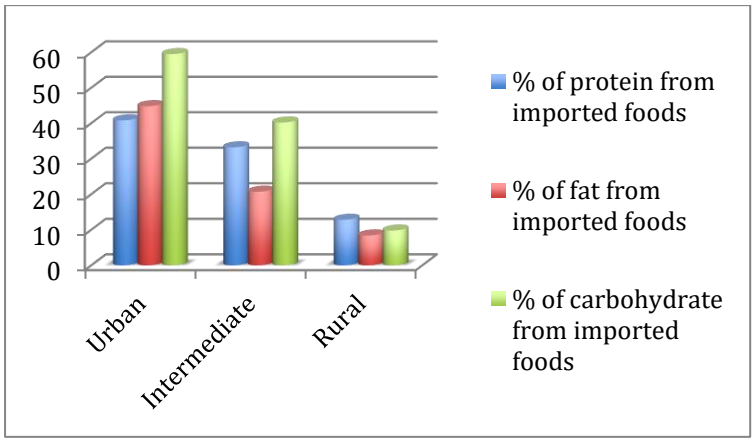

Figure 8. Percentage of protein, fat and carbohydrates from imported foods consumed daily by males in three population groups in Vanuatu

(Data source: SPC (1985) Vanuatu dietary study).

Root crops and cooking bananas (plantains) are still the main staples of the rural diet of Vanuatu. These are generally boiled, baked or made into laplap (a local dish). On average, the rural male consumed 1,118 g of root crops/banana plus 705 g of laplap/tuluk. In addition, a considerable amount of slippery cabbage (island cabbage) and coconut cream contained in the laplap, another 67 g of dark green leaves and 23 ml of coconut cream were consumed. In the same 24-hour period, they also ate 119 g of fresh fruit (ripe banana and pawpaw). Traditionally, meat was usually consumed on feasts. However, rural people now have access to trade stores, which sell tinned foods and frozen meat. On average, a rural male's daily consumption was 51 g fresh meat and 14 g of tinned meat/fish. In addition to tinned meat/fish, the men also ate other imported foods: 18% consumed rice, 14% ate bread, 20% added sugar to drinks, 6% consumed food cooked with oil and 8% used full cream powdered milk.

Pacific Islanders traditionally depended on fishing for household income and livelihood. With more rural people migrating to urban centres looking for paid salary, their dependency on fishing activities is reduced. This is reflected in the decline in fish consumption and nutritional status reviewed from nine studies[27], that reported moderate iodine deficiency in Vanuatu where only 30% of participants consumed mostly fresh fish.

Rural areas that are experiencing rapid cultural change can see the obesity prevalence increase in only a short period. Follow-up surveys conducted in 2011 suggest that prevalence of obesity (defined by BMI) has increased since 2007 among both men and women in Efate[28].

Vanuatu is experiencing a rapid increase in obesity with modernisation. This is most evident in more economically developed regions such as suburban Efate. A recent survey[29] of 534 adults from three islands varying in level of economic development reported that obesity prevalence was lowest among rural and highest among suburban participants. Prevalence of central obesity was particularly high among women (up to 73.9%), even in rural areas (ranging from 14.7% to 41.2%). Heavier reliance on animal protein and incorporation of Western foods in the diet – specifically, tinned fish and instant noodles – was significantly associated with increased obesity risk. Even in rural areas where diets and lifestyles remain largely traditional, modest incorporation of Western foods in the diet can contribute to an increased risk of obesity. Early prevention efforts are thus particularly important during health transition. Where public health resources are limited, education about dietary change could be the best target for prevention.

Increased animal protein intake is one behavioural contributor to increased obesity risk[8]. The pattern of increased meat intake with economic development often includes a heavier reliance on processed foods, such as tinned fish and tinned meat, which contributes independently to measures of obesity. Both the nutrient content and the preparation methods of tinned fish likely contribute to its association with obesity. Tinned fish canned in oil or sauce has a higher fat content than most types of fresh fish and are often served with instant noodles and rice, whereas fresh fish and meat more often accompany dishes made with traditional root crops and vegetables, which are less calorie-dense by comparison. A heavy reliance on tinned fish in

[27] Charlton *et al*., 2016. Fish, food security and health in Pacific Island countries and territories: A systematic literature review. BMC Public Health Series.
[28] Olszowy KM, Pomer A, Dancause KN, 2012. Exploring the health transition in Vanuatu: Longitudinal data comparisons from 2007 to 2011 Am J Hum Biol. 2012;24:212.
[29] Dancause, K. N., Vilar, M., Wilson, M., Soloway, N. E., DeHuff, C., Chan, C., Tarivonda, L., Regenvanu, R., Kaneko, A., Lum, K. and Garruto, R.M. (2013). Behavioral risk factors for obesity during health transition in Vanuatu, South Pacific. Obesity (Silver Spring), 21(1): 98–104.

urban areas was noted during the first known nutrition survey conducted in Vanuatu in 1951[30]. Similar findings were reported by the Vanuatu Ministry of Health 1998 NCD survey, which highlighted associations among obesity and daily consumption of non-traditional fat sources such as cooking oil, margarine/butter, milk, fresh meat, poultry, tinned meat, and tinned fish[31]. These studies suggest that tinned fish might contribute more to the risk of non-traditional fats compared to fresh meat (including poultry). In fact, including fresh meat in the non-traditional fats category displaces other less healthy options in the diet. While fresh fish remains a major part of the diet in Vanuatu, it is not available in all areas and only seasonally in others. In this case, fresh meat might be a better dietary option than tinned fish.

Refined carbohydrates also contribute to an increased obesity risk. Packaged '2-minute' noodles are popular in Vanuatu and are associated with an increased risk of obesity based BMI and body fat among men. Nutrition education is not widespread in Vanuatu, so it is not commonly known how energy-dense and nutrient-poor these products are. They are chosen largely for their convenience. Most people have little knowledge of the nutritional value of different classes/types of foods. To improve this knowledge on nutritional value, prioritising nutrition education was recommended as early the 1950s and those recommendations remain equally relevant today.

Where public health resources are limited, prioritising messages about the risks of packaged and processed foods such as instant noodles, and heavy reliance on animal protein – especially more processed forms – could have a positive impact on population health.

The impact of agriculture and nutrition policies on food and nutrition outcomes

According to the Ministry of Health, NCDs are among the leading causes of death (70%) and disability in the country. Malnutrition in young children is also a serious problem. It is the fifth most common cause of hospital admissions and the sixth most common cause of death in children under the age of 5 years, where malnutrition was the principal diagnosis. In many cases, a relationship exists between infection and malnutrition, which increases the severity of both and this, has been commonly associated with environmental and social factors and the standard of living.

If proper nutrition interventions are not delivered to children before the age of 24 months, they could suffer irreversible cognitive impairments, which will persist into their adult life. Poor maternal nutrition, anaemia and malaria, are very prevalent in Vanuatu and are associated with lower birth weights. Between 10 % and 15 % of ni-Vanuatu children have a low birth weight (< 2,500 g). Improved nutrition could allow children to reach their intellectual and physical potential and greatly increase opportunities for future national achievements.

The major nutritional problem for children in Vanuatu is protein-energy malnutrition (PEM), which is manifested by a failure to grow. Other nutritional problems are less prevalent, although

[30] Malcolm, S. (1952). Nutritional investigations in the New Hebrides. South Pacific Commission Technical Paper No 23. Noumea, New Caledonia.
[31] Carlot –Tary, M. (1998). Vanuatu non-communicable disease survey report. Secretariat of the Pacific Community, Noumea, New Caledonia.

iron deficiency, which is often associated with PEM and infectious diseases, is likely to be common. Other micronutrient deficiencies such as vitamin A are rare but need further investigation.

According to the 1983 National Nutritional Survey (NNS), about one in four (23 %) children under the age of 5 years were under-weight-for age (below 80 % of the median NCHS standard). About 17 % of children surveyed showed evidence of acute or recent malnutrition. The survey found that the rate of underweight children after birth was 5 % at 0-6 months, 48 % at 12-17 months and 40 % of children at one to two years were underweight and over half of them were acutely or recently malnourished. After two years of age, the rate of underweight children gradually declined.

When comparing the 1983 National Nutrition Survey to that of 1996 and 2007, although the nutritional status of children has improved, the children in the second year of life continued to be at risk of nutritional insufficiency. The high level of underweight found in children 6-12 years of age is a result of poor and inadequate weaning diets. Supplementary and weaning foods usually consist of traditional starchy staples such as taro, yams, banana and sweet potato. Fruits and soup are occasionally given, and fish, green vegetables and meat are introduced late or rarely given. The starchy staples by themselves do not have the concentration of nutrients required to meet the nutritional requirement of a rapidly growing young child, and intake is limited by the food's bulk.

Cultural feeding practices, such as timing of introducing supplementary food and the type of food given, and modern lifestyle, such as time pressure on working mothers are also factors. This points to the need for enabling policies and programmes that give priority for maternal education for improving the nutritional status of children

Fishing and fish products plays an important part in the protein content of the Vanuatu population's diet providing 16% to 18% of their yearly protein requirements. Imported fish products (mostly tinned fish) account for 32% to 35% of the fish supply[32]. In order to give more priority to local fish products in the protein supply, the Government introduced an ambitious development programme for artisanal commercial fisheries at village level. The development of small-scale commercial fisheries has been one of the priorities in the first two Five Year Development Plans (1982-1986, 1987-1991). This policy was implemented in 1982 with the introduction of a development programme for commercial village fisheries: Village Fisheries Development Programme (VFDP).

The main purpose of the VFDP was to develop commercial fisheries at village level. The objectives were:

1. To improve the nutrition of rural and urban dwellers;
2. To reduce the imports of tinned fish;
3. To develop the cash economy in village communities;
4. To create employment opportunities and cut down the urban drift into Port Vila.

These policy objectives were commercially oriented and priority given to exporting overseas and supplying the urban and tourist markets with species of fish with high commercial value.

[32] David, G and Gillaurren, E (1992). Food security and village fisheries in Vanuatu. ORSTOM, Port Vila.

For island economies, this activity would result in cash generated from sale of fish in the capital Port Vila, which in turn would lead to the development of associated commercial activities and provide employment for the rural population. There was demand from overseas markets for the type of species marketed and this very successful venture was providing opportunity for development of cash economy and preventing urban drift through employment opportunity. The nutrition objective was not met because the fishing was entirely geared to the outside market with no direct contribution to improving nutrition of rural population from fisheries development. However, the income generated enabled families to increase their food expenditure on imported tinned fish and thus significantly compensate for the lack of commercial supply of fresh fish. Therefore, the fourth objective of the VFDP to reduce the imports of tinned fish was not achieved.

Key findings of the nutrition and health status of the ni-Vanuatu population were reported in the 2007 Vanuatu Nutrition Survey report[33] and the STEPs Survey report[34]. These are summarised below and the corresponding policy recommendations are presented in Appendix 1:

1. Nutritional status of children under five (based on the WHO 2005 standard)

Stunting remains a public health problem among children under five in Vanuatu. 11 % of children under the age of five are moderately or severely underweight. Just over a quarter of all children under five years old (26.3 %) are stunted and 5.8 % are wasted (too thin for their height). The prevalence of both underweight and stunting increased rapidly with age from 6 to 24 months of age. The prevalence of overweight is 4.5 %, reaching 8.2 % in urban areas.

2. Nutritional status of non-pregnant women aged 15-49 years

Overweight and obesity remain prevalent among ni-Vanuatu women of reproductive age. 47.1 % of women are overweight (BMI>25), 10 % of these women are obsessed and 4.2 % are very obsessed (BMI>35). Only 2.4 % of women of reproductive age are underweight for height (BMI<18.5). A greater proportion of women of reproductive age living in urban areas are overweight and obsessed than in rural areas (53.5 % compared to 43.5 %).

3. Iodine nutrition of non-pregnant women aged 15-49 years

Iodised salt use is low and consequently, iodine deficiency is wide spread throughout the ni-Vanuatu population. Using results from quantitative iodine analysis, 73.3 % of households use salt with no iodine while only 23.7 % use salt with 15ppm or more of iodine. Iodised salt use is associated with urban residential type and households with a higher wealth index.

Iodine nutrition among non-pregnant women of reproductive age is very poor; national median urinary iodine excretion (UIE) is 77µg/l and 29.7 % of women have iodine less than 50 µg/l. Only 39.4 % of women have UIE levels above 100 µg/l. The median UIE of women in urban areas and women from households in the richest wealth quintile reached borderline sufficiency with median levels from 103.5µg/l and 110 µg/l respectively, however, these levels are lower than the recommended minimum median of 150 µg/l for pregnant women, indicating that foetal brain development will be still compromised among these groups should they become pregnant.

[33] UNICEF. (2007). Vanuatu Nutrition Survey. UNICEF Pacific Office, Fiji.

[34] World Health Organization. (2010). Vanuatu Preliminary STEPs Survey Report, WHO Western Pacific Regional Office, Fiji.

4. Anaemia of children aged 6-50 months and non-pregnant women aged 15-49 years

Anaemia is a public health problem for ni-Vanuatu children and for non-pregnant women of reproductive age throughout the country. 33.6 % of ni-Vanuatu children aged 6-59 months are anaemic (Hb <11g/dl). 20.9 % of ni-Vanuatu women are anaemic (Hb <12g/dl). The prevalence of anaemia is exceptionally high among children aged 6-12 and 12-24 months old, with anaemia at 61.3 % and 46.5 % respectively.

5. Malaria Infection of children aged 6-59 months and non-pregnant women aged 15-49 years

Very few cases of blood smear positive malaria were found during the survey. Only 6 cases among children and 5 cases among women were found.

6. Parasite infection among children aged 24-59 months

Nationally, over half (62 %) of children in this age group had at least one parasite (72.3 % among children in rural areas) infection. The most commonly found parasite is round worm (*Ascaris lubricoides*) (35.3 % of children) infected with round worms.

7. Infant and young child feeding practices

Early breastfeeding initiation practices are relatively found in Vanuatu, especially in urban areas. However, low exclusive and continued breastfeeding rates are having a negative effect on infant and young child health in the country. 71.9 % of ni-Vanuatu women start breastfeeding within one hour of their infant's birth. However, only 39.7 % of infants aged 0-5 months are exclusively breastfed. The majority of infants are given other milk liquids, formula and/or complementary food before 6 months of age. Only 44.9 % of children 0-11 months old are considered to be appropriately fed according to WHO recommendations.

The above findings indicate that there has been no major change in the nutrition situation of young children and women of reproductive age since the 1996 nutrition survey and that over nutrition among women appears to have increased. In addition, new information about iodine deficiency and anaemia among women of reproductive age and about anaemia and parasite infection among children aged 6-59 months indicate previously unrecognised problems of public health significance. Urgent action is needed to address the high prevalence of malnutrition (in particular stunting, anaemia and iodine deficiency) throughout the country.

The situation with iodine deficiency in Vanuatu is particularly striking, since it is avoidable given the availability of fish and its importance in the diets. Many countries in the world have legislation for iodisation of salt sold for human consumption. Where this has been effectively implemented the result has been a significant reduction, and in some cases elimination, of iodine deficiency. The same could be true in Vanuatu if national legislation is put in place and enforced.

The Vanuatu NCD risk Factors STEPS survey report (2013) found among the sample (≥4000) that were surveyed, the prevalence of overall obesity was 18.8% and that it was more prevalent among women (23.3%) than men (13.9%)[3]. Other findings included low consumption of fruits and vegetables; 58.2% of men and 65.0% of women were eating less than the recommended 5 servings on average per day. It also found that 28.6% of the sample were hypertensive; 30.8% were men and 26.7% women. Raised blood glucose, indicative of diabetes was found in 21.2% of the sample; 21.4% in men and 21.0% in women.

The current and potential future nutritional problems in Vanuatu will only be addressed by adopting a broad-based multi-sectoral approach. Some attempts have been made to achieve this by the development of a National Food and Nutrition Policy in the years following the NNS. Although the NFNC is charged with over-seeing the implementation of the policy, further initiatives in health, agriculture, and community development are necessary and more detailed inter-sectoral planning of strategies to achieve policy objectives is essential. The major immediate needs appear to be relevant nutrition and health education to families and communities, and the development of adequate support networks for mothers in both rural and urban areas. In the long term the role of food production in agriculture and continued development of support systems for rural and urban women are policy areas which need to be addressed, both to deal with food and nutrition security issues and also the role of women in child care and agriculture and time pressures that result. The NFNC must take a more proactive role in initiating future policy developments, planning and coordinating strategies to achieve policy objectives if the problem of malnutrition is going to be adequately addressed.

Until action is taken to improve the situation it will be impossible to achieve the Sustainable Development Goal “Zero Hunger” as well as reduce the chances of achieving the other goals. Globally, effective interventions already exist for each of the childhood nutritional problems identified l in Vanuatu (underweight, stunting, micronutrient deficiencies). Among the currently available interventions: breastfeeding counselling, appropriate complementary feeding, universal salt iodization, food fortification with iron folic acid (and possibly zinc), deworming and improving the quality of the diet along with increased physical activity are recommended to have the greatest impact in reducing child and maternal deaths and disease burden and to improve child cognitive development.

Based on the survey findings and the information above, key recommendations from the MICS National Nutritional Survey are as follows:

1. Reposition both over- and under- nutrition much higher in the development agenda of Vanuatu and integrate it with all other development initiatives.
2. Focus combined efforts of the government and development agencies on addressing the causes of the most important nutrition-related problems identified in the MICS - National Nutrition Survey and any other recent studies of the nutrition situation.
3. Better characterise the likely causes of some of the problems identified as well as the most effective interventions to address them; most importantly to understand and improve infant and young child feeding practices.

Overall, urgent and effective action is needed to combat malnutrition in Vanuatu, where the current burden of malnutrition (under - and - over) is high. The Millennium Development Goal 1 of halving *severe hunger* by 2015 had not been achieved; and action has to be taken for achieving the SDGs for a more productive life for ni-Vanuatu especially children in the near future.

Case studies

Farm Support Association case study

Farm Support Association (FSA) is a non-profit organisation and its speciality is agricultural research to support smallholder farmers to be sustainable and resilient by empowering them with knowledge, skills and capacities through technical advice and hands on training and mentoring. The organisation's ultimate goal is to provide skills to farmers to enable them to practice appropriate and sustainable agricultural techniques for effective management of their farms as a business, source of food and cash to meet their basic needs. FSA also enables farmers to help other farmers through the creation of a farmers' network.

Whilst agriculture is the most accessible livelihood for many ni-Vanuatu to farm for their food and source of income, the truth is there are now fewer people with agriculture skills as a result of youth migration for urban centres resulting in farmers producing less and less on their farms.

According to FSA, the current issues of food insecurity are linked to urban drift, increased population pressures, decreased soil fertility, and increased consumption of imported cheap foods and less consumption of local food. FSA is trying to restore the passion for and value of agriculture into peoples' lives. The organisation wants the government and NGOs to recognise that agriculture is a viable and productive sector and is dependent on infrastructure, economic policy and the global market. It seeks to integrate farmers' experiences with national policy development and sectoral planning.

FSA and OXFAM had written a book on the "Stories of change", containing 24 cases of stories of change reflecting on and demonstrating how FSA has had a significant positive impact on the lives of many farmers in Vanuatu. The 24 case stories, all from Tanna Island, tell of their successes in farming for food security, increased cash income, better livelihood and propensity to save money to expand their farming business and pay for education costs and other needs like health services.

Though the case stories did not explicitly mention increased food production for household food and nutrition security there is clear evidence of the agriculture and nutrition nexus from these case stories.

Case study 1 – Vegetable farmer near Port Vila

Name: Steven Charlie

Location: Teouma Bush, Maumau School, Efate

Attended FSA training at Rural Training College and learned how to grow vegetables using composting techniques to prepare seedlings in a nursery. He in turn has trained his wife and other family members to help him farm his block of land just outside Port Vila. "I train my family members so that they can help me work the farm. I cannot do all this labour work myself".

He and his family grow round or ball cabbage and lettuces for sale at Port Vila main market. Current crop of round cabbage when visited was on a small plot about 900 m^2 but he has more land to expand. He said there is demand for fresh vegetables in Port Vila and he sells all his crops quickly when he takes them to market. "Consumers or buyers prefer my cabbages and

lettuces because they look fresh and I sell them cheaper than what they can buy from supermarkets".

He said he is successful because of the training and initial start-up inputs he received from FSA. In future he wants to employ people to expand his farm and earn enough money to send his children to school and also to build a permanent house on the block.

Case study 2 – Pig farmer from Santo Island

Name: Anthony Seketa

Age: 59 years

Location: Chapuis, Luganville, Espiritu Santo

Anthony Seketa is a pig farmer from Chapuis in Luganville, on Santo Island. He is a retired government and church executive, but his wife is a fulltime employee. They have grown up children and grandchildren. Anthony started his piggery farming business in November 2014 at the outskirt of Luganville town with the assistance from FSA, the department of livestock and horticulture and a private farmer. His piggery business is called "San Search Pig Project".

During his formal employment, he was diagnosed with high blood pressure that was attributed to lifestyle and stress from his various executive roles. He decided to quit his employment to take care of himself. After retiring from his formal employment, he wanted to get into some form of income generating activities that he also enjoys so he established this project.

He approached FSA and the department of livestock and horticulture who directed him to a private farmer who was selling good breed of pigs to other farmers. He purchased 5 sows and one boar in 2014 and started his piggery.

Anthony wanted to be a role model for other people living in the same area, in particular to demonstrate that one can use a small space to do a small business like this piggery project and get a good income. He received technical knowledge and assistance from the department of livestock and horticulture and FSA as well as from other private partners in pig husbandry practice. He is now a successful pig farmer on Santo Island.

The extra income he earns from this project has helped his family a great deal. The piggery project has provided the source of protein for his family. The manure from the piggery is used in the garden for compost to plant vegetables. The project has provided all the food for their needs and for their customary, church and family obligations. In 2016, their income from the piggery project was 1.6 million Vatu. Most of the earnings were ploughed back into the business.

With regard to food consumption patterns, the project has reduced their spending on store foods and he and his wife are advocates for eating local fresh foods for good health.

Anthony said extra physical exercise at the piggery has greatly reduced his high blood pressure and said: "I do not have too many stresses anymore because I don't have to answer to anyone, I am my own boss". He would like this piggery project to be a role model for other NCD sufferers and smallholder farmers so that the pig industry can grow and hope that one day in future they will look to export markets.

Case study 3 – Pig and poultry farmer from Santo Island

Name: Mark Kenneth

Age: 37 years

Location: Perol, Southern outskirt of Luganville, Santo Island

Mark Kenneth is a 37-year-old man from Perol Area on the southern outskirts of Luganville. He currently works fulltime for Paradise Butcher in Luganville and at the same time, Mark is a pig and poultry farmer.

Mark started his poultry project in 2001 and piggery project in 2009. FSA assisted him in getting his day-old chicken for the poultry project and later they helped him to source boar and sow for his piggery project. Mark also received training and technical assistance from FSA on pig and poultry husbandry, especially their feeding regimes.

His project has been up and down, but most recently the projects have been increasing steadily and have given him confidence to expand his business further especially his poultry project. He needs extra finance for his expansion plans, but is not sure how to source extra finance.

He currently has 30 pigs and over 200 chickens (layers) and he wants to increase his layers to 1000, as the egg business is very good. He supplies eggs to shops, restaurants, food stalls, and butcheries, and also sells to the public.

The project is helping to finance his family's extra needs and communities and he is able to save some money as well as put some income back into his business. He uses his wages for their daily household needs.

With his experience he gives advice to the members of the community on how to manage pigs and poultry. As his family resides in a semi urban area their food supply is not a problem. Most of the food supplies come from the garden, although they choose to purchase store foods as the younger people prefer to eat rice, bread, etc.

Mark said his family's choice to eat more local foods from the garden is to save money and not for health reasons. Mark himself has high blood pressure and is on medication and was advised by the nurse to eat more local food. His dad who is in his 60s also has high blood pressure and is on medication. In his community they have a stroke case and a few malnutrition cases among children under the age of 5 years.

Case study 4 – Vegetable farmer from Sara Village East Santo Island

Name: May Harry

Age: 41 years

Location: Sara Village, East of Santo Island

May Harry is a 41-year-old vegetable farmer from Sara Village, East Santo. Her family has been planting and selling root vegetables especially kumala (sweet potato), yam, taro, banana and island cabbage since she was very young. She grew up with her family making extra gardens for the Luganville market.

In the last few years she has been getting vegetable seedlings from FSA to add extra marketable products in her garden. She finds the seeds that FSA supplied through the Syndicat Agricole 100 times better than what the other shops in town are selling. It only takes two to three days for the seeds to germinate and start planting in the garden. This in turn gives her a couple of months before harvesting the vegetables to sell in the market.

The extra vegetables she is planting have increased the household's income tremendously and have benefitted them for their school fees, church activities and other community commitments. Her average income from the market per month is about 60,000 vatu. From this she also manages to save some in the bank on a monthly basis, and is able to buy store foods to support her children who are in school in town, especially rice, biscuit, toiletries, etc.

Food supply in her household is more than enough as they have so much food in the garden and also are able to purchase store foods if they want to. They mostly consume local foods and purchase imported foods when they are tired of eating local foods. They know very well the importance of local foods to their health.

In their community there was only one person with diabetes who had her leg amputated. As far as she knows there are not too many signs of malnutrition or NCDs in the community.

Lessons from the four case studies

Many lessons can be learned from the case studies, but four key lessons are:

1. **Increasing production of local nutritious foods**
   Small improvements in cropping method from traditional subsistence to commercial market-oriented cropping pattern farmers are able to see an increase in the yield and quality of their staple food crops e.g. taro.

2. **Training next generation farmers new farming skills and knowledge**
   Training the next generation of farmers in sustainable food production by incorporating traditional knowledge with modern skills is essential for the changing economy. E.g. FSA training and empowerment is enabling many young ni-Vanuatu to commercialise food crop and livestock farming.

3. **Diversified food production**

   Increasing numbers of farmers are diversifying their staple root crops with vegetables, fruits livestock and trees of value e.g. saddle wood.

4. **Young people engaged in farming for living**

   Many young people who left school or education careers because of lack of school fees are engaged in farming for living. They are earning income from selling their produce in markets and are able to save money.

5. **Food and nutrition security**
   All respondents of the case studies have experienced farming provides plenty and a variety of nutritious food to eat. Apart from increased cash income from farming activities they are food and nutrition secure.

6. **Physical activity reduces prevalence of NCDs**
   Working on farms engages in more physical activities resulting in less stress and reduced high blood pressure. NCD sufferers find farming helpful in regaining their health and wellbeing.

Lessons learned

The nutritional impacts of agricultural interventions

Agricultural interventions in Vanuatu have had both a negative and a positive impact on nutrition of the target population.

Negative impact – Increased prevalence of NCDs and dietary deficiency as a consequence of increased consumption of imported foods high in saturated fats, salt and sugar. It is evident that agricultural commercialisation (cash cropping and commercial food crop production for household income) had attributed to changes in food consumption pattern, particularly when the commodity prices are good. When household income is increased there is increased cash availability and so a greater need to purchase food. Increasing household consumption of purchased foods, a large proportion of which are imported, is one of the most important consequences of agricultural interventions.

Positive impact – Increased availability of locally grown nutritious foods in local markets is attributed to agricultural interventions such as FSA. Increased availability of varieties of crops suggests that there is increased consumption of locally grown foods. Consumers can choose from varieties of nutritious foods available at local markets. “Stories of change” show that raising chicken for meat and eggs on Tanna Island is a profitable venture for local farmers because of a preference for fresh locally grown protein sources, indicating that there is a change in the dietary pattern of people on Tanna Island, although indicators for nutritional status and health of consumers are not immediately apparent.

Gender outcomes of agricultural interventions

It is difficult to quantitatively measure specific gender outcomes directly attributed to by agricultural interventions. However, women play a major part in contributing to family food and nutrition security, household income generation and children welfare. Any tangible outcomes to women will automatically ripple throughout the household and will be seen in family’s health and wellbeing.

There is evidence that FSA programmes have given confidence to men, women, youths and school drops to become successful commercial farmers and have positive outcomes in future. Examples of these farmers are shown in Table 1 below.

Table 1. Examples of success stories of gender outcomes through FSA interventions.

Gender description	Commercial farming activity	His/her story
Female, age 53 years, returned home after seasonal work in New Zealand. *When disaster strikes she perseveres.*	Poultry farmer on Tanna Island.	"I feel empowered owning this poultry farming business, it has given me a confidence that I didn't know I could have because I can now earn a consistent income for my family".
Male (youth), age 18 years and school dropout. *Temporary setback leads to a successful future.*	Mix root crops (taro, cassava and kava), livestock (poultry, pigs & cattle) and timber crop (sandalwood).	"The FSA and the Napil Rural Training College gave me another chance to succeed in life. Many young people in my village don't have much to look forward to and I am glad that I have these businesses to focus on. Because of that I have high hopes for the future".
Male, age 30 years. A root crop subsistence gardener. *Root crop gardener turns into a triple threat.*	Root crop and vegetable farm, poultry farm and beehives.	"I now have three different kinds of farms, a vegetable farm, a poultry farm and now I'm starting a bee farm. My plan is to expand all my farms, so that in future I can earn money and look into starting other types of businesses".
Female (youth), age 19 years. Sick for several weeks and left school. *Taking an alternate route.*	Mix root crops (taro, cassava and sweet potato) and livestock (poultry, pigs and cattle).	"Everyone doesn't excel in primary and secondary schools. I may not be good at formal school but I am good in farming and gardening. I can now combine what I learned as I grew up with what I'm learning in the trainings".
Female (youth), age 18 years. Student turn farmer trainer. *An emerging social butterfly spreads her wings.*	Fresh vegetables (carrots).	"When I started my own garden shortly after joining RTC, I practiced the crop spacing and mulching methods we were taught, and I saw that my crops have grown quite well from using these techniques. I am now teaching my parents how to produce local chicken feeds. I'm glad that they are showing an interest in the trainings because I know in the future it will be beneficial for us all".

Discussion and conclusion

Vanuatu is dealing with a burden of both over and under malnutrition due to unhealthy dietary habits. The negative impact of both under nutrition (from not eating enough safe and nutritious foods) leading to nutrition deficiency illnesses such as anaemia (iron deficiency) and stunting (iodine deficiency and low goitrogenic function) and over nutrition (from eating too much unhealthy food which are usually high in salt, sugar and saturated fat) leading to lifestyle diseases such as diabetes, heart diseases, some cancers and obesity, have contributed to the increasing burden of NCDs in Vanuatu.

People's diets affect their health in one way or another. Good health and nutrition status is an important prerequisite for national development. Healthy people are more productive and will have the capacity to build a prosperous nation. It is essential that people not only have access to enough food, but the food needs to be nutritious to sustain healthy lifestyles.

Vanuatu has a scarcity of baseline data for policy makers and planning to define and track development indicators. The food and nutrition security agenda has been prioritised in the agriculture policy strategies. Vanuatu Nutrition Policy and Vanuatu Plan for Action on Food and Nutrition Security have well defined strategies to achieve nutritional outcomes and reduce the prevalence of NCDs. Both policies require synergies and a holistic approach to implement the plans, independent from the department of agriculture, livestock and horticulture and the department of health.

Overcoming institutional barriers to coordinated action on agriculture and nutrition

Barriers to food and nutrition security in Vanuatu include limited enforcement of regulations, low investment in agriculture, inadequate access to information and low awareness among consumers, lack of multisectoral cooperation in government and poor engagement with the food industry.

Coordination is crucial for the involvement of multisector participation that contributes many resources and assistance that influence people's eating habits and consumption behaviour. The three major sectors include government sectors, private sectors and civil societies. Each sector has an important role to play in mitigating the effects of these factors to ensure a food secure Vanuatu. Government has the obligation of protecting its citizens while at the same time fostering economic growth and development among the private sectors. Civil societies include the various communities in which people live and interact, and other NGOs. They all have a role in ensuring participation of consumers in the food security debate. Partnerships and collaborations among these different sectors will require strong leadership, coordination and accountability mechanisms as often these sectors will have competing interests.

Leadership and coordination were identified as a priority area for action during the 2009 national food summit to address food security and ensure a food secure Vanuatu. The coordinating efforts of government sectors are an essential component of implementation of government policies and plans.

The 2009 national food summit found that in terms of local food production, food and nutrition security was seen as compromised by the low perceived status of those who farm and fish in

‘modern’ Vanuatu and the subsequent need to encourage young people to get involved in agricultural production and marketing activities as well as the need for better support for farming and fishing industries by identifying better ways to process and market local foods. Local foods have to be processed and packaged so that they can compete directly with imported foods in terms of convenience to prepare and consume.

In addition, the agricultural sector needs political will and policy support from all stakeholders working together to define strategies and policies which integrate traditional production systems with ‘free market’ economic concepts in terms of production volume requirements, marketing and pricing elasticises. In this way, the price of traditional foods could become competitive with imported foods such as rice. This can be a long-term strategy and will require considerable support from the government to implement. If, for example, the current price subsidy for copra were transferred to traditional food crops such as taro, yam, and manioc, this would surely benefit local market prices and subsequent demand by consumers, and local farming households will benefit from a more stable local market.

These are extremely difficult issues to deal with because of the number of different agencies involved and the need to change the behaviour of people from imported foods towards consuming a more ‘traditional diet’. The strategies and policies must be developed for a long-term solution but the immediate priorities to address are to increase the production of traditional foods using climate resistance and disease-tolerant varieties and adapting best practiced farming systems to compensate for the lack of suitable land for a traditional slash-and-burn food production system.

The statistics on agricultural production clearly show that more needs to be done in the agricultural sector to improve the livelihoods of people in rural areas. Farmers, fishermen and growers need adequate technical support, hybrid drought and disease-tolerant varieties, access to affordable credit, post-harvest storage and processing facilities, appropriate quality standards and, most importantly, training to take advantage of opportunities for local and international export markets for traditional root crops and cash crops.

Current initiatives around reviving the co-operative organic branding and standards for meeting EU markets need to continue and be complemented by other programmes for local and regional markets with less stringent import requirements. Significant investment and political direction is required in the primary sector if Vanuatu wants to make any progress towards achieving food and nutrition security.

To this effect, the 2009 summit participants recommended that the codex committee be strengthened, and its terms of reference amended to include food and nutrition security, as it was the only multisectoral committee operating at the time that dealt with food. To facilitate the establishment of a national coordinating body, the Vanuatu codex committee’s terms of references need to be amended to include food security. The committee then becomes the Vanuatu national codex and food security coordinating council to be supported by a standalone office to be known as Vanuatu Codex and Food Security Office. It is recommended that the office should be staffed by one fulltime equivalent position of a codex and food security and nutrition coordinator who will also serve as the national codex focal person. The key action under this strategic objective is the establishment of the codex and food security coordinating council and office.

To ensure stability, it is prudent to allow the Ministry of Trade to lead the implementation of this objective as the Vanuatu national codex committee is currently hosted by the Ministry of Trade, Industry, Commerce and Tourism.

Learning from good practice

FSA's Stories of change provide evidence of how learning from good farming practices have aspired farmers to change their livelihood. Training, input support and mentoring from FSA have enhanced and sustained food production, processing, trading, marketing, and using of safe and nutritious foods by people of Tanna Island. The model if out-scaled with increased support from government and other development partners will no doubt ensure a food and nutrition secure Vanuatu. FSA model is taking a 'farm to fork' approach and is ticking all the boxes of food security definition described as:

> *"Food security is improved when people have physical, social and economic access to sufficient safe and nutritious foods to meet their dietary needs and food preferences for an active and healthy life. Having access to sufficient safe and nutritious foods depends on whether the food is available, can it be purchased or grown, even if available is the food acceptable or preferred, are there risks of losing this access to the supply due to economic or environmental shocks and whether the food is safe to use to meet dietary needs for good health. Taking a 'farm to fork' approach addresses the multiple dimensions of food security along the food chain from production through to end-use".*

The government of Vanuatu should recognise the important contribution FSA is making to strengthen and increase productivity and production of the primary sector (agriculture and fisheries sectors) for the domestic market to strengthen national food and nutrition security policy and reduce dependence on food imports. The recommended actions for the primary sector development is to focus on both exploring production for export to niche markets as well as increasing production for domestic consumption.

The elements of learning from good practice of FSA model are:

1. *Aspire* – Train and provide initial input support;
2. *Mentoring* – Train and visit;
3. *Farmer networking* – Farmers helping farmers 'seeing is believing';
4. *Research* – Soil fertility improvement for the utilisation of unsuitable land.

Next steps

1. Value chain development and food industry partnerships engagement

There are many factors that influence what people choose to eat. There is a need to empower food producers to engage with food industries to encourage consumers to purchase locally grown and processed nutritious foods. To foster full community participation requires the engagement of full value chain players in the food industry including governments to make healthy choices along the food value chain. Education alone does not often translate to action. Strategic health communications to raise awareness, share information and to create supportive environments are needed to enable and empower people to make healthy choices. Engaging food industry partners to raise awareness of their contribution to promoting and protecting consumer health through production, trading and marketing of healthy food options is an important action plan. Healthy food choices need to be made available, affordable, accessible and acceptable to consumers.

2. Regulatory frameworks, enforcement and compliance and public-private sector collaborations

This is an important step forward for Vanuatu plan for action on food and nutrition security and it is recommended that it be revisited and additional resources allocated for implementation. Collaborations between public and private sectors is important for the formulation and implementation of regulatory frameworks that not only promote fair trading of food but also protect consumers by ensuring the minimum standards of the nutrition quality and safety of foods being marketed are maintained. In an environment of increasing dependence on imported foods, there is a lack of food regulations in place to ensure compliance with minimum requirements for food safety and quality standards.

Food control systems need to be strengthened in order to facilitate trade and protect consumers from poor quality and unsafe foods. Enforcement of legislations also needs strengthening. Food businesses also need support to implement voluntary measures to improve the nutrition profile of their products through reformulation or other means to ensure available food is safe and nutritious to eat.

3. Training and empowering young farmers

Youth unemployment is a social time bomb ready to explode when the political and social environments become unbearable. Training and empowering young people with seed capital and initial farming inputs to return to land and develop viable and sustainable agri-enterprises is crucial for national development. Stories of change by young farmers who received training and mentoring by FSA are to be encouraged and strengthened by the Vanuatu government, private sector organisations, donor partners and international technical agencies like CTA, EDF, IFAD, NZAID, AusAID and others.

4. Protecting the vulnerable gender

Infants, young children and women are the most vulnerable population groups not only in Vanuatu but also throughout the Pacific. Protecting those most vulnerable to the adverse impacts of food insecurity is especially important given the high dependency of these groups on others for food and survival. The sustainable development goals recognise the importance of protecting the poor, women and children. Effective actions must take into account the needs of those most susceptible to food and nutrition insecurity.

Appendix 1 Key findings and policy implications of 2007 nutrition survey

Key findings and issues	Policy implications
Stunting is a main public health problem. The survey shows that 26.3% of children under 5 are stunted.	1. Integration of nutrition education into all aspects of community development into nutrition.
Prevalence of anaemia among children 6-59 months and women in the reproductive age group is high: 33.6% of children 6-59 months are anaemic (HB<11g/dl) and 20% of reproductive aged women are anaemic (HB<12g/dl).	1. Infant and complimentary feeding must be one of the main focus areas of the public health programme. 2. Iron supplementation to school girls and young women in the reproductive age group. 3. Food fortification. 4. Community and school garden projects supported.
Iodine deficiency Poor iodine nutrition especially among women of reproductive age with only 39.4% of women with UIE level above 100µg/l.	1. Vanuatu should review/develop strategy for iodine deficiency disorders, this includes continuous assessment of the current situation of its salt iodisation programme to identify national or sub-national problems and to update its strategies and actions. 2. The first strategy is universal salt iodisation by ensuring the iodisation of salt for consumption by both humans and animals. 3. Given that less than 20% of households have access to iodised salt, the most vulnerable groups, pregnant and lactating women, should be supplemented with iodine, and children 7-24 months of age should be given either a supplement or complementary food fortified with iodine until the salt iodisation programme is scaled up.
Low iodised salt use: Nationally, 73.3% of households use salt with no iodine.	1. Review legislation on imported salt and ensure that all imported salt for domestic use

	is adequately iodised and packaged to prevent loss of iodine. 2. Institute regular monitoring of the salt iodisation at port of entry and strong corrective measures on traders whose salt imports do not meet the iodisation standard. 3. Include promotion of the use of iodised salts for cooking in the integrated MNCH communication plan shown in number 4 (below).
Low exclusive breastfeeding rate: only 39.7% of babies 0-5 months are exclusively breastfed.	1. Ensure that all hospitals are certified and awarded the 10-steps WHO-UNICEF baby friendly hospital initiative, including formation of community breastfeeding support groups. 2. Legislate and enforce implementation of the international code of marketing of breast milk substitutes, e.g., no free samples of milk substitutes to hospitals. 3. Increase maternity leave and formulate workplace policies that allow employed working mothers to exclusively breastfeed for six months. 4. Develop one integrated maternal, newborn and child health communication and health promotion plan that includes raising awareness of the benefits of exclusive breastfeeding, targeting political, traditional, religious and institutional leaders and other decision makers. 5. Procure equipment and supplies for all health facilities to screen pregnant women for anaemia, syphilis and HIV, which indicate maternal nutritional status and main causes of low birth weight of babies.
Relatively good breastfeeding initiation with 71.9% of babies breastfed within the first hour after delivery.	

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