

# Linking farmers to markets: Realizing opportunities for locally produced food on domestic and tourist markets in Palau



Sub-regional Office for the Pacific Islands

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## Acronyms and Abbreviations

ADB	Asian Development Bank
BMR	Bureau of Marine Resources
BOA	Bureau of Agriculture
BOT	Bureau of Tourism
BTA	Belau Tourism Association
CIF	Cash Insurance Freight
CPI	Consumer Price Index
EQPB	Environmental Quality Protection Board
FAO	Food and Agriculture Organization
FOB	Freight On Board
GDP	Gross Domestic Product
GRT	Gross Revenue Tax
HIES	Household Income and Expenditure Survey
IMF	International Monetary Fund
MNRET	Ministry of Natural Resources Environment and Tourism
MOE	Ministry of Education
MOF	Ministry of Finance
MTDS	Medium Term Development Strategy
NCD	Non-Communicable Disease
NDBP	National Development Bank Palau
OISCA	Organization for Industrial, Spiritual & Cultural Advancement
PCOC	Palau Chamber of Commerce
PICs	Pacific Island Countries
PMA	Palau Mission Academy
PPR	Palau Pacific Resort
PTFA	Palau Taiwan Farmers Association
PVA	Palau Visitor Authority
SBDC	Small Business Development Centre
SMEs	Small & Medium Enterprises
TTM	Taiwan Technical Mission
UNDP	United Nations Development Program
USDA	United States Department of Agriculture
VAT	Value Added Tax

## Executive Summary

Improving the capacity of the agriculture sector to supply the domestic market with nutritious local produce is critical to addressing the threats to national food security currently facing the Republic of Palau. Fostering backwards linkages between the agriculture sector and the larger tourism and services sector of the economy will create new income generating opportunities for rural households. In order to facilitate these linkages and reduce national food insecurity, Palau should adopt a series of recommended policy, regulatory and programmatic interventions necessary to create an enabling environment for agriculture sector growth. The recommended actions are outlined in this report.

Palau's high rate of dependence on imported food is a concern. Their level of food import dependence – estimated at some 86 per cent - creates a vulnerability to external food supply shocks and price volatility in global food markets, which has the potential to reduce household access to key food commodities, and reduce their food security. In addition, a historical shift in diet away from locally sourced root crops and fish to imported food products high in fat and salt has contributed to a rising level of obesity and diet related Non-Communicable Diseases (NCDs) such as diabetes, which has seen an increase in mortality, morbidity, and health care costs. This has led agriculture sector policy-makers to identify improving the capacity of the agriculture sector to supply domestic markets, as a key strategy for improving food security.

The agriculture sector in Palau remains at present small and subsistence oriented, with only a limited commercial subsector that lacks the capacity to supply the needs of the resident population as well as a growing number of tourist visitors. However this unmet demand represents a significant market opportunity. Latent consumer preferences for local produce, particularly from the tourist sector, offer incentives for local farmers to invest in the production of fruit and vegetables. With the right public sector support in technical assistance, market intelligence, marketing assistance, tax and tariff benefits, as well as regulatory support, the Government of Palau can significantly increase the competitiveness of local produce versus imports, and improve their share of domestic and tourist sector demand.

Visitor arrivals to Palau have more than doubled over the past ten years, increasing from around 59,000 in 2002 to over 118,000 in 2012. The food hospitality sector thus presents a significant market for fresh food produce. However this market's food needs are overwhelmingly supplied by imports. As tourism is likely to remain the most valuable industry for Palau, it is important to ensure an increasing portion of each tourist dollar spent stays inside the country and in turn creates additional income generating opportunities for local businesses. One method of achieving this would be to increase the proportion of agricultural products consumed by the industry, which are locally supplied. Major obstacles to improving the share of local producers is their lack of capacity to supply fruit and vegetables consistently year-round; the lack of efficient utilization of local feed milling in order to reduce the costs of chicken, pig and aquaculture production, and increase their competitiveness against imports; and the inability of local producers to meet the product quality standards required by the industry. As a result, it is critical that local farmers adopt farming systems capable of delivering a year-round supply of high quality produce;

and further develop the capacity of local animal feed milling, thus reducing feed and production costs. Therefore, the public sector must facilitate greater investment in the adoption of more efficient production systems through better access to affordable finance, improved technical and business support systems and an enabling policy and regulatory environment for agribusiness development. In order to improve the service capacity of the agriculture sector, it is also critical that the public sector facilitate improved coordination of supply among farmers, and assist them to identify the standard of product necessary to meet the tourist market's specific quality demands.

At the request of the Government of Palau the Food and Agriculture Organization (FAO) was asked to help identify the specific domestic and tourist markets for locally produced food, and the policy, regulatory and programmatic interventions that would help the agriculture sector realize these opportunities, in order to reduce food import dependence. This report presents those recommendations, and the evidence which supports them.

### *Objective 1: Increased farm productivity with a more competitive domestic supply chain*

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To access and compete with imported food in the higher value domestic and tourist markets local producers will need to consistently achieve the quantity, quality, packaging requirements, delivery schedules and price points demanded by these markets. To upgrade and enter into such business supply chains will require increased farm productivity through more efficient farming and improved marketing systems.

Together meat and eggs constituted around 63 percent of fresh produce imports in 2013, indicating that the greatest gains for food import substitution would come from investing in improving competitiveness in the livestock sector. The recent establishment of a local feed mill capacity at the Bureau of Agriculture (BOA) has provided a significant opportunity to enhance local pig and chicken production. To realize the full potential of this feed mill asset, which could also produce feed for aquaculture, it will be necessary to establish a viable business model for the operation with a strong management involvement of the private sector livestock farmers who will depend on the mills consistent output of competitively priced feed. A growers' cooperative may provide a suitable model for the mill operation and should be further explored with stakeholders.

**Recommendation 1: The BOA, following consultation with stakeholders, should establish a viable business model for the livestock feed mill operation through a public-private partnership with a strong management involvement of the private sector livestock farmers.**

Local eggs have an advantage over imported eggs in terms of freshness, but currently this is not clearly demonstrated as egg cartons in Palau retail outlets do not indicate product shelf life or sell by date. With the in-country capacity now available to produce local chicken feed the price competitiveness of local eggs should improve, enabling local producers to capture a greater share of domestic market demand. In order to protect local standards of food safety and ensure a fair trading environment for domestic

producers, a regulated 'egg standard' should be enforced which stipulates that the product sell by date is clearly marked on all egg cartons.

**Recommendation 2: The Division of Environmental Health should promulgate a clear 'egg standard' and enforce compliance to protect public health and facilitate fair trading practices.**

Tropical fruits constitute one market where local production should maintain a competitive advantage over imported substitutes, given the high preference for locally produced fruit by the tourism sector. However a major challenge to improving the capacity of the local tropical fruit industry is the level of the country's infestation with fruit flies. A significant increase in public sector investment in fruit fly control and eradication is required if this industry is to flourish. Furthermore, several popular fruits exhibit sharp seasonality and are only available for a limited time each year. As the tourist food hospitality sector demands a consistent year-round supply of popular fruit choices the adoption of plant varieties and technologies to promote off-season production is critical to growing the share of local producers in this market.

**Recommendation 3: To enable increased year-round production of quality local fresh fruit the BOA should work with the Ministry of Finance (MOF) and development partners to design and implement a long-term fruit fly control and eradication program, as well as a technical assistance package to assist farmers to extend fruiting seasons through flower induction technology and selection of appropriate varieties.**

Extending affordable finance to agricultural Small and Medium Enterprises (SMEs) will be essential to facilitating import substitution by enabling farmers to borrow to invest in purchasing the technological inputs required to increase returns to labor and land, while extending the fruit and vegetable growing seasons and upgrading livestock production systems. While there already exists facilities for finance for agricultural development in Palau, the high credit eligibility standards required to access these funds and a lack of capacity among local farmers to present sound business plans to financial institutions have impeded this sector's ability to access these loan products. The Small Business Development Centre (SBDC), the BOA and the NDBP could assist agriculture sector stakeholders increase their rate of access to low-interest finance by working with private sector partners with experience of small business development and outreach to: (i) identify viable agricultural market opportunities and loan recipients in order to develop a pipeline of 'bankable' agribusiness projects to finance; (ii) prepare information tools to assist the NDBP and agriculture sector stakeholders to identify the profitability of agribusiness enterprises and prepare business plans, such as through the calculation of the gross margins that can be expected from new approaches to fruit, vegetable and livestock production; and (iii) providing mentoring assistance to strengthen farmers implement their business planning and effectively manage an agribusiness enterprise.

**Recommendation 4: The Small Business Development Centre (SBDC) and BOA working in partnership with the Palau Chamber of Commerce (PCOC) and with support by partner technical agencies should put together a portfolio of bankable agribusiness projects.**



**Recommendation 5: In order to facilitate economic and financial feasibility assessments for business planning and to strengthen the business case for loan applications the BOA should, in partnership with partner technical agencies, prepare a farm manual containing gross margin analysis and farm budgets for all key crop and livestock enterprises.**

**Recommendation 6: The SBDC together with the PCOC should develop a technical assistance proposal for the implementation of a business mentoring program designed to assist loan recipients more effectively manage their agribusiness. This program would pair loan recipients with, seasoned local and overseas business owners and operators with experience of agribusiness management.**

Minimizing the tax burden on the primary sector is critical to increasing the profitability of agricultural enterprise in Palau, and therefore central to incentivising investment in local agri-business development. The Government of Palau has proposed to adopt a tax reform bill that will replace the Gross Revenue Tax (GRT) with a single rate Value Added Tax with no exemptions for locally marketed products. This tax will add 10 percent to the cost of all imported food as well as to locally produced food. In order to strengthen food security and improve the price competitiveness of locally produced food against imports, it should be exempt from VAT. Such an exemption would have a minimal impact upon Government tax revenue, and help foster investment in local agribusiness.

**Recommendation 7: The BOA should work with the local agriculture sector to lobby the MOF to exempt locally produced food from any proposed VAT system.**

### *Objective 2: Improved marketing and coordination in supply and demand*

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Improving the collection and dissemination of market intelligence to local farmers will assist them to better plan and co-ordinate production and marketing to the tourist sector. Some of the larger tourist outlets have demonstrated their willingness to share information on their present and future demand for local fresh food products (quality and quantity) to agriculture sector stakeholders, in order to assist local farmers to supply their needs. This information must be collected and shared with farmers in a systematic way if it is to foster improved co-operation and co-ordination of the supply of agricultural products to tourism. Local farmer organizations could be instrumental in forging sustainable supply relationships between their members and the tourism sector by regularly collecting this information from tourism operators (chefs/purchasing officers) and sharing it with their farmers in order to co-ordinate supply.

**Recommendation 8: The PVA and the BTA should work together with the PCOC and the BOA and the Palau-Taiwan Farmers Association (PTFA) to develop a pilot scheme for collecting forecasts from participating hotels and retail outlets, of their future demand (quality and quantity) for select fruit and vegetable products, and sharing it with their members in order to help them plan their production, and co-ordinate supply to this sector.**

Providing promotional benefits to tourism outlets for their use of local ingredients would drive increased demand for local produce and encourage their participation in schemes designed to promote greater co-operation between growers and local buyers. It would also help to the Palau tourism industry appeal to a broader cross-section of tourists, and benefit industry earnings by also encouraging guests to increase their rate of food and beverage expenditure.

Rising consumer expectations of food and beverage standards and variety are changing the way the tourism industry markets itself to tourist from high-income countries. In order to help differentiate themselves from other surf and sand resort destinations around the world, many tourist operators have sought to respond to this consumer trend by changing their menus to offer greater local content, focusing on the freshness and traditions of local produce. Whilst Palau has already established itself as “world-class” diving resort, it could further boost the attractiveness of the country as a destination for high-end tourists by offering a distinctive local cuisine experience to visitors. However few hospitality businesses in Palau have identified that improving the “cuisine experiences” offered to their guests, by incorporating locally produced ingredients into their menus, would offer them significant income benefits.

National tourism authorities could encourage tourism outlets to develop menus that include innovative recipes involving local ingredients by offering additional marketing benefits, such as features in promotional materials. . This could possibly be coupled with an accreditation system that identifies hotels/resorts/restaurants that provide a quality local cuisine experience with high local fresh produce content.

**Recommendation 9: The PVA together with BTA and PCOC should build a promotional campaign around the use of local fresh produce in the food and beverage experience in Palau by inviting tourism operators and chefs who are particularly innovative in their use of local food to identify some initiatives to help differentiate the Palau tourism brand as a destination offering a unique ‘cuisine experience’. The BOT should investigate the potential for using an accreditation process that identifies tourism operators that provide a quality local cuisine experience with high local fresh produce content.**

### *3. Improved co-ordination of policy and regulatory reform*

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Strengthening food security in Palau depends upon improving policy coherence and the coordination of interventions across a number of sectors, including health, finance, education and agriculture. In order to facilitate greater co-operation across these diverse sectors, the Government of Palau should form a high level statutory body with the ability to draft and implement multi-sector interventions, and transform the food system in Palau through collaborative policy making. This ‘Food Policy Council’ should oversee investigating the feasibility and adoption of the technical policy recommendations presented in this report.

**Recommendation 10: The Ministry of Natural Resources, Environment and Tourism (MNRET) should join with the Ministries of Finance, Health and Education and the Office of the President to facilitate**

**the establishment of Food Policy Council with mandate to design and implement whole of government policy measures to address the strategic issues common to food production and consumption trends in Palau; and to enhance co-operation between the public and private sectors to ensure a sustainable, healthy and equitable food system.**

A key role for the Food Policy Council would be to address the NCD crisis in Palau by introducing practical measures to lower salt intake and reduce obesity by encouraging increased consumption of locally produced nutritious food. To arrest the dramatic increase in NCDs, consumers should face disincentives for the consumption of food and beverage products which have a negative impact on health. These are identified as food and beverage products for which a 100g serve contain rates of salt (sodium) and saturated fat which are higher than a third (33 %) of the daily recommended intake. Revenue raised from this 'health excise' should be directed to improving the availability and affordability of fruits and vegetables. In order to facilitate the introduction of this excise, the government should work with partner International organizations to develop an implementation plan for this policy which would include: (i) identifying food products which are high in salt, saturated fat or sugar and should thus be subjected to a health tax; (ii) analyzing the impact of different levels of excise on these products on their consumption, and an accurate estimation of the revenue such levies would raise for investment in encouraging the consumption of health alternatives; and (iii) developing cost effective proposals for improving access of at risk groups to affordable fruit and vegetable products.

Improving the quality of the school lunch program by including greater local fresh produce content would help establish healthy consumption habits among the nation's youth, and is one example of a practical and affordable program aimed at a particularly vulnerable group.

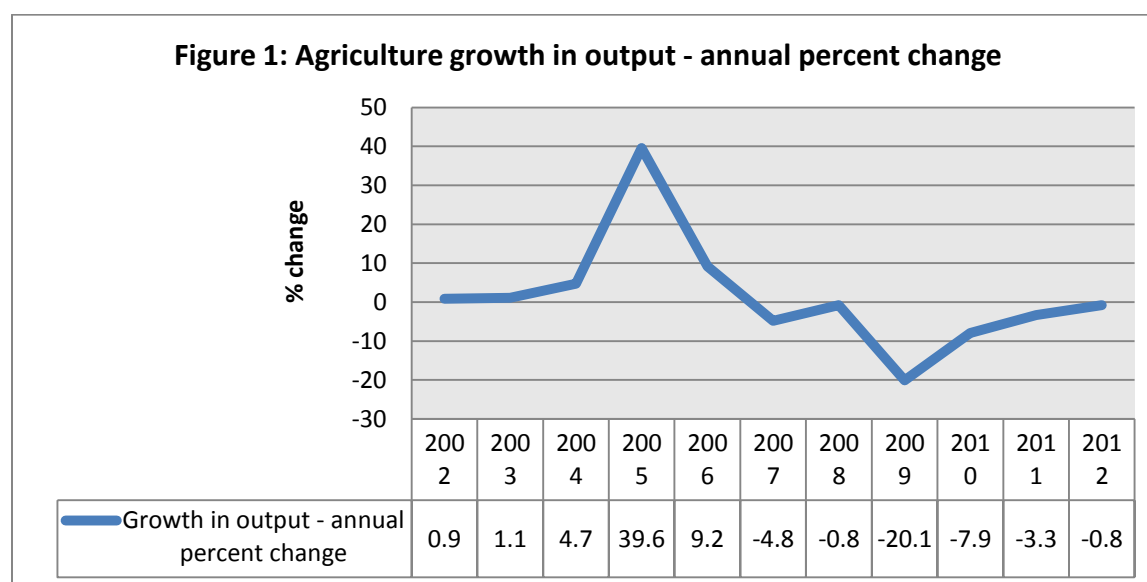
**Recommendation 11: The MOF together with the Ministry of Health and BOA should lead the consultation for and implementation of a 'health excise' on food products with a negative impact on NCDs, and the identification of priority programmes for facilitating improved access to healthier substitute products.**

**Recommendation 12: The Ministry of Health NCD Unit should lead a process together with the MOE, the BOA and the MOF to review the school lunch program and provide a healthier menu choice including more local fresh produce (fruits and vegetables) and redesign the procurement and distribution system for the food to facilitate increased purchasing from local farmers.**

## 1. Introduction

The Republic of Palau consists of more than 340 individual islands, of which only nine are inhabited. With around 77 percent of the estimated 19,900 population living in Koror Island and adjacent Airai State<sup>1</sup>, Palau is one of the most urbanized small island countries in the Pacific region. The largest island, Badeldaob, constituting approximately 80 percent of the Republic's 189 square miles of land area, is linked by causeway to the capital. Palau's limited arable land is largely restricted to Babeldaob Island, where a high content of clay and land degraded by bauxite mining during its colonial era, have effectively removed large areas from agricultural development. The Rock Islands, remnants of ancient uplifted coral reefs, lie in a 23-mile long lagoon between Koror and Peleliu which contains some of the world's most renowned diving sites and is a major tourist attraction.

Tourism is the main source of national economic income and employment in Palau. Grant assistance, particularly from the United States under the Compact Agreement which is currently set to end in 2024, also represents an importance source of revenue for the country. Over recent years, tourism has contributed about three quarters of GDP growth, more than 80 percent of exports of goods and services, 15 percent of total tax revenue, and 40 percent of total employment.<sup>2</sup> In contrast, official statistics indicate that agriculture/forestry contribute only about 1.6 percent of GDP and fishing 3.3 percent. While Palau maintains a significant amount of unused land with the potential to supply agricultural products to a growing domestic and tourist market, attracting local labor to the agriculture sector has been difficult, leading to a fairly low level of commercial supply of local produce. Consequently, growth in the agriculture sector remains small and has declined significantly in recent years (Figure 1).



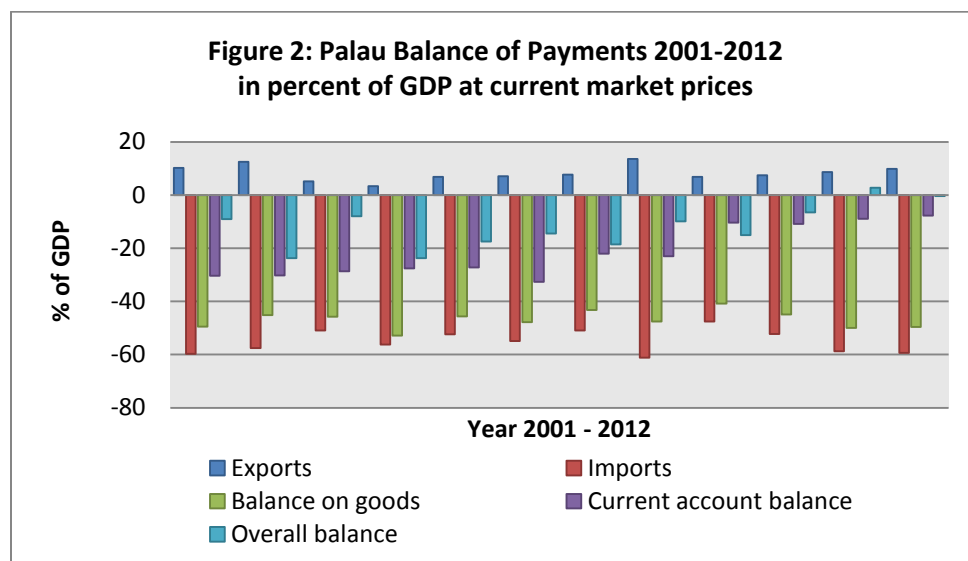
Source: ADB Key Indicators for Asia and the Pacific 2013

As a result, Palau's economy is characterized by a large trade deficit offset by services income, remittances, Compact payments, and other official transfers, with the overall balance of payments registering negative in most years (Figure 2). Virtually all manufactured goods are imported, and the value of imports is close to two thirds of Palau's GDP. Food imports, valued at about US\$31 million in

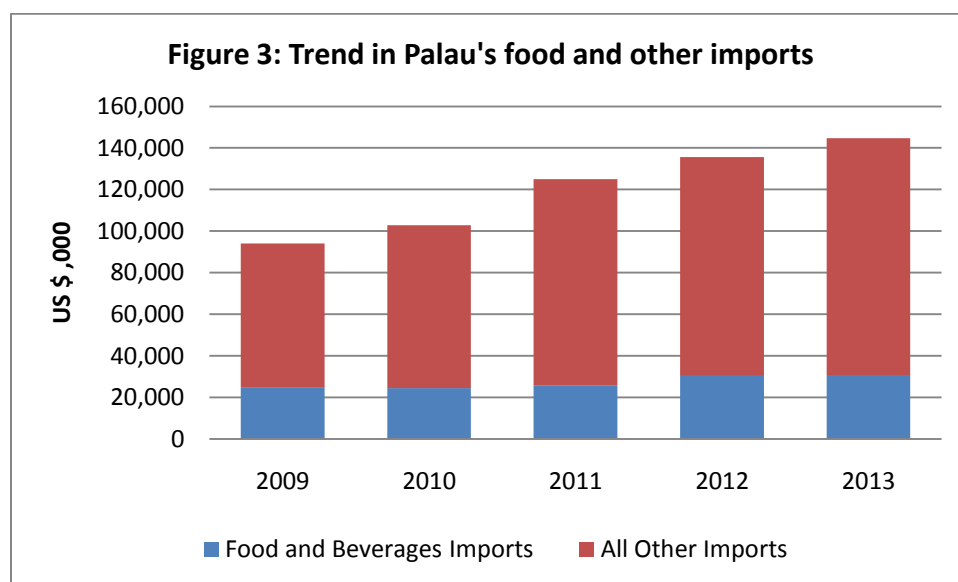
<sup>1</sup> Ministry of Finance 2012 Statistical Year Book, Republic of Palau - population estimate based on 2005 Census.

<sup>2</sup> IMF (2014) Republic of Palau 2014 Article IV Consultation, IMF Country Report No. 14/110

2013 are at a level 100 percent higher than in 2004, and represent 20 percent of total merchandised imports (Figure 3) and 82 per cent of the value of all food available in the economy<sup>3</sup>. Palau's merchandise exports, valued at US\$ 9.4 million in 2012, consist primarily of fish (US\$ 7.2 million).<sup>4</sup>



Source: ADB 2013 Key Indicators for Asia and the Pacific



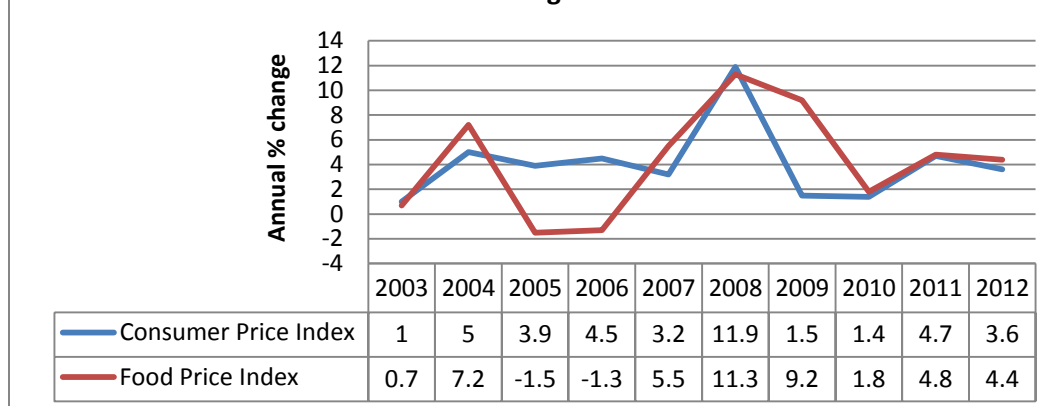
Palau Customs Office, Ministry of Finance

Palau's vulnerability to external food supply shocks and price volatility in global food markets has significantly increased as a result of its rising dependence upon imported sources of food. Indeed, the cost of food increased by some 12.2 per cent in 2008 as a result of a spike in global food commodity prices with local food prices consistently rising at a rate higher than the general inflation rate (Figure 4).

<sup>3</sup> FAO and SPC (2014) Food Security Indicators database, accessed 20/6/2014

<sup>4</sup> Ministry of Finance 2012 Statistical Year Book, Republic of Palau – Bureau of Budget and Planning

**Figure 4: Annual Change (%) in Palau's Food Price Index and CPI during 2003-2012**



Source: Ministry of Finance—Office of Planning and Statistics, Bureau of Budget and Planning

Palau has also undergone a dietary transition that has contributed to a rising level of obesity and diet related Non-Communicable Diseases (NCDs), as its households increasingly depend upon cheap imported food products high in salt and fat. At present, NCDs are responsible for 78 percent of deaths in Palau, with evidence that NCD related mortality and morbidity are rising.<sup>5</sup> Other findings of risk factors based on community assessments reveal that inadequate diets in fruits and vegetables, lack of physical activity, and other lifestyle behaviors contribute to overweight and obesity and subsequent diabetes and NCDs.<sup>6</sup>

Currently only a small commercial sub-sector, largely driven by foreigners, is producing vegetable crops for the local and tourist markets. As a result, supply is well below demand. Palauan traditional farming systems remain largely semi-subsistent, producing root crops, cassava, betel nut and pepper leaf for own consumption. These systems rotate vegetable crops on annual basis, using a mix of organic and inorganic inputs to ameliorate the relatively infertile acid soils. Traditional subsistence systems predominantly involved production by women, but as some of these become semi-commercial they increasingly employ foreign labor to assist with farm work. Betel nut and taro constitute the main cash crops within the traditional system and some reporters suggest annual betel nut trade is worth more than US\$15 million. Palau taro is renowned for its diversity and excellent quality and remains central to Palauan culture. While market trade in taro remains brisk, no official statistics on local market activity are collected. In addition, the inability of local producers to effectively market their produce to tourism and supermarkets, as a result of the quality requirements they imposed, has reduced the participation of agriculture in the formal economic sector, and increased the food import dependence of Palau.

The Palau government has identified that the agriculture sector must refocus on improving its competitiveness and capacity to supply the domestic and growing tourist market for food products. Consequently, the Food and Agriculture Organization (FAO) was requested to assist the government of

<sup>5</sup> Republic of Palau Non-communicable Disease Prevention and Control Strategic Plan of Action 2015-2020, Draft copy dated 20 April 2014.

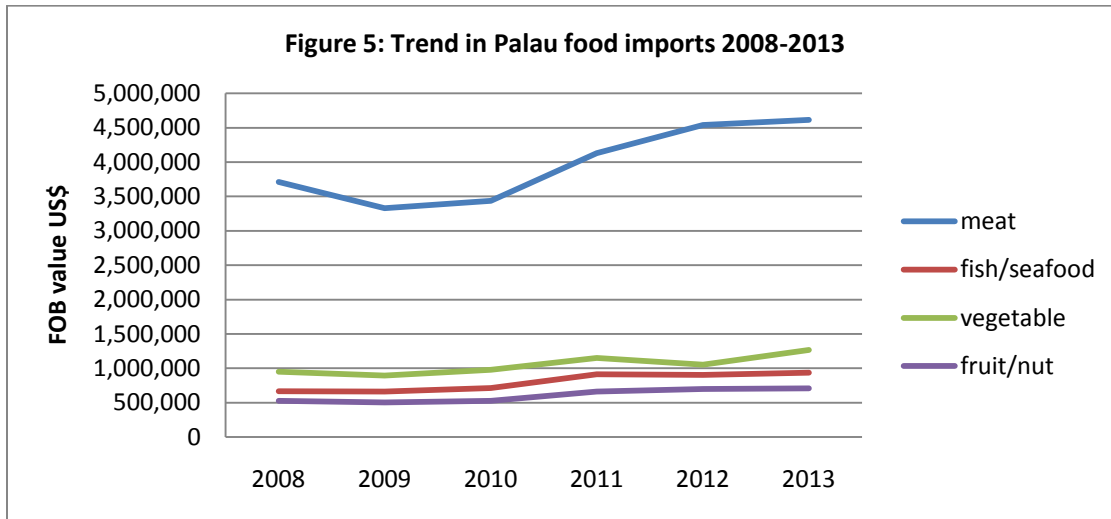
<sup>6</sup> Ichiho H.M, Demei Y., Kuartei S. and Aitaoto N. (2013) An Assessment of Non-Communicable Diseases, Diabetes, and Related Risk Factors in the Republic of Palau: A Systems Perspective. Hawaii J Med Public Health, May 2013, 72 (5 Suppl. 1): 98-105.

the Palau to identify the policy, regulatory and programmatic changes that would help improve the competitiveness of locally produced food on domestic and tourist markets, in order to reduce the nation's food import dependence and strengthen food security. This report provides 12 recommended actions that will help the Palau achieve this objective.

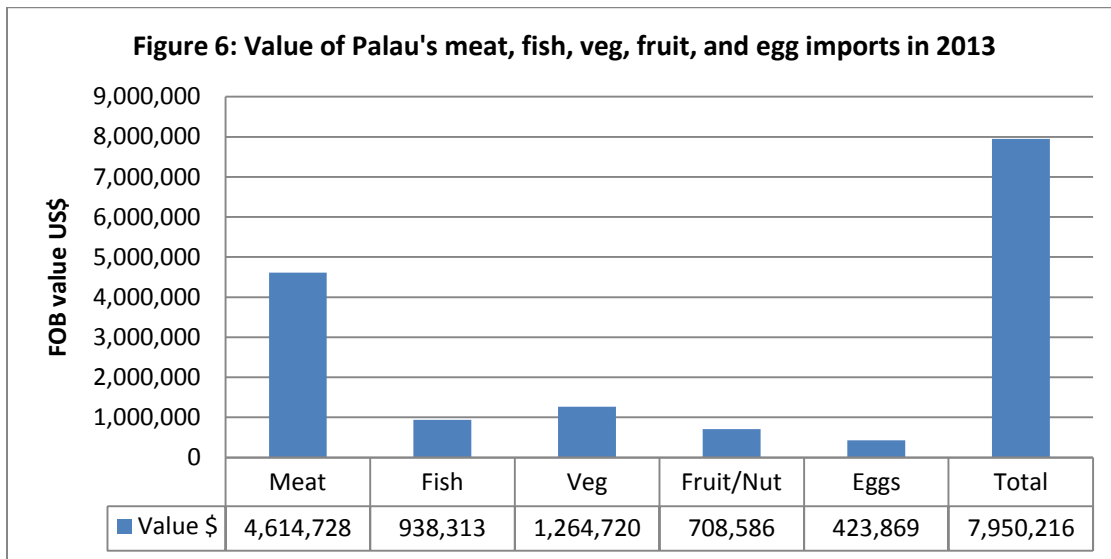
Following this introduction the report is divided into five sections. Section 2 provides background evidence of the food import trends in Palau for selected commodities. Section 3 presents the challenges to facilitating profitable business opportunities in agriculture and recommends actions needed to support a more competitive domestic supply chain. Section 4 provides evidence of domestic marketing opportunities, and methods to improve co-ordination of market intelligence, and marketing to the tourism sector. Section 5 provides a methodology for improving the co-ordination of the policy, regulatory and program interventions required to enhance synergies between public and private actors with a stake in improving the access of Palauans to nutritious, competitively priced food. Finally, Section 6 draws conclusions and a summary policy/program action matrix is presented in Annex 1.

## 2. Food import trends and opportunities for import substitution

The values of Palau’s meat and horticultural imports have all increased over the last five years, but its import of meats has shown the steepest rise (Figure 5). The Free-On- Board (FOB)<sup>7</sup> value of these food imports reached close to US\$ 8 million in 2013, with meats constituting the largest share at around US\$ 4.6 million (Figure 6). All food products are currently imported into Palau duty free.



Source: Palau Customs Office, Ministry of Finance



Source: Palau Customs Office, Ministry of Finance

<sup>7</sup> Palau still uses the FOB valuation of imports rather than CIF and this means that the real on-shore cost of imports is somewhat higher than these reported figures.



## Meat and eggs

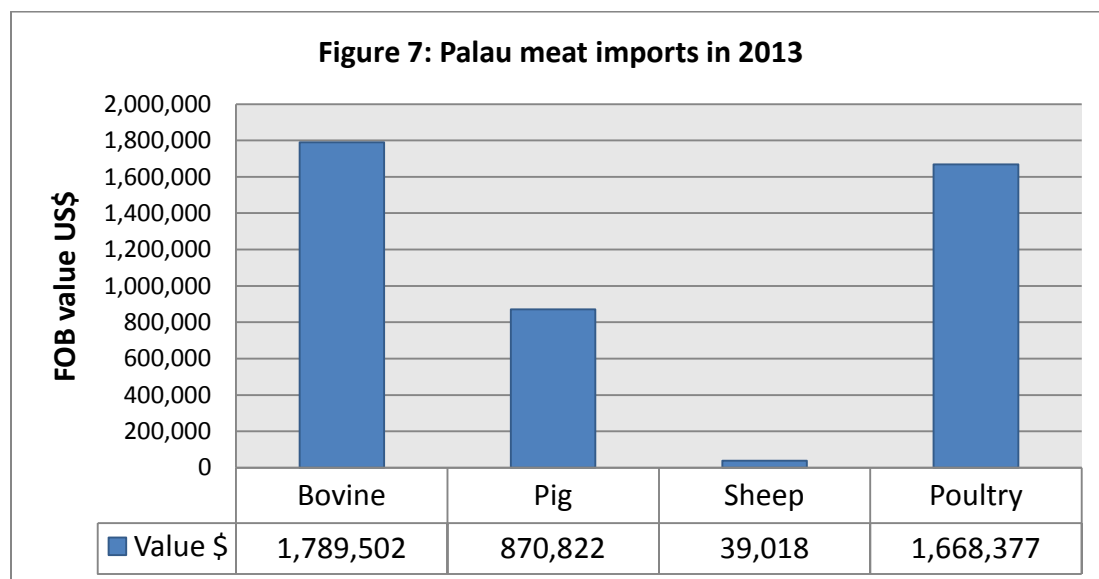
Meat and eggs constituted around 63 percent of the value of fresh produce imports into Palau in 2013, indicating that the greatest gains for food import substitution would come from investing in improving



Roast suckling pig for sale at Palau Night Market

competitiveness in the livestock sector. However, livestock production in Palau is primarily directed to the home consumption and customary exchange markets. With the largest share of the Nation's population living in urban areas where the rearing of livestock is restricted, and the exchange of live pigs remaining central to a Palauan's fulfillment of their customary obligations, the commercial trade in locally produced pigs remains vibrant, particularly through the bi-

monthly "Night Market" which attracts both residents and tourists.



Source: Palau Customs Office, Ministry of Finance

While significant demand exists, the cost of imported livestock feed is a major barrier to growth in the livestock sector. However, the recent establishment of a local feed mill capacity at the Bureau of



Feed mill installed at the BOA premises

Agriculture (BOA), with assistance from the Taiwan Technical Mission (TTM), has provided a significant opportunity to enhance local pig and chicken production by reducing the cost of feed to producers. Whilst the main constituents of feeds (currently soybean meal, wheat grain and corn) are still imported, milling and mixing locally has the potential to significantly reduce feed costs. The mill only produces around eighty 66lbs bags of pig feed per month and some chicken feed for the TTM and BOA's experimental farm at present, however.

The pig feed is sold to about six farmers at a cost of US\$30 per bag which is only marginally cheaper than imported commercial feed sold at US\$25 per 50lbs bag.<sup>8</sup>

To realize the full potential of this feed mill asset, which could also produce feed for aquaculture it will be necessary to establish a viable business model for the operation. Inviting the involvement of the private sector livestock farmers who will ultimately provide the major market for the mills output to be involved in the development of this plan, will help to ensure the production of a higher quantity of more competitively priced feed. A growers’ cooperative may provide a suitable model for the mill operation and should be further explored with stakeholders. TTM also have in the pipeline support for slaughterhouse facilities to ensure a hygienic meat processing chain which will be essential to meet food safety standards to enable marketing of meat products to domestic commercial outlets. To be sustainable the slaughterhouse operation would also benefit from an appropriate public-private partnership arrangement and suitable business model.

**Recommendation 1: The BOA, following consultation with stakeholders, should establish a viable business model for the livestock feed mill operation through a public – private partnership with a strong management involvement of the private sector livestock farmers.**

In 2013 Palau imported 214,350 dozen eggs from the US, equivalent to 7,047 per day.<sup>9</sup> The Palau



Mission Academy (PMA) farm is the only significant layer operation producing local eggs which are marketed in retail outlets. A spot check in a Koror supermarket indicated that local eggs (small size) were priced at \$3.09 per dozen compared to US imported eggs (medium size) priced at \$2.99 per dozen. Whilst the current output of the PMA farm was not established, Customs data show that live chick imports are significant: ranging from 4,000 to 9,100 per year (Table 1). This implies a local flock size

well in excess of 6,000 birds with a capacity to produce over 5,000 eggs per day.

**Table 1: Palau Live Chick Imports in 2008 - 2013**

Year	2008	2009	2010	2011	2012	2013
Live chick Imports	6,550	8,100	9,100	7,500	4,000	7,500

*Source: Customs Office, Ministry of Finance*

Local eggs have an advantage over imported eggs in terms of freshness, but currently this is not clearly demonstrated as egg cartons viewed in Palau retail outlets do not indicate product shelf life or sell by date. With the in-country capacity now available to produce local chicken feed mixes, the price competitiveness of local eggs could also be improved. In order to ensure the freshness of the product for consumers, as well as fair labeling and food safety, Palau should adopt an egg standard be applied to all

<sup>8</sup> Personal communication Trebkul Tellei, Bureau of Agriculture

<sup>9</sup> Customs Office, Ministry of Finance

egg handlers. This should cover primary production, sorting, grading, storing, transporting, packaging, distributing and supplying of eggs from domestic or imported sources. A key feature should be a specified shelf life for eggs kept at a cool temperature ( $\leq 40^{\circ}\text{F}$ ) with a prescribed labeling requirement that storage conditions and ‘sell by date’ must be clearly marked on the egg container. The 2004 Environmental Health Regulations Article 7: Food Sales: Labeling Requirements, subsections B and C (see below), already provides adequate provision for egg carton labeling, but this needs to be properly enforced.

*“(b) The food shall bear or have attached to it or be in a package that bears or has attached to it a label setting out, in addition to any particulars required by subsection (a) above, all of any of the following particulars:*

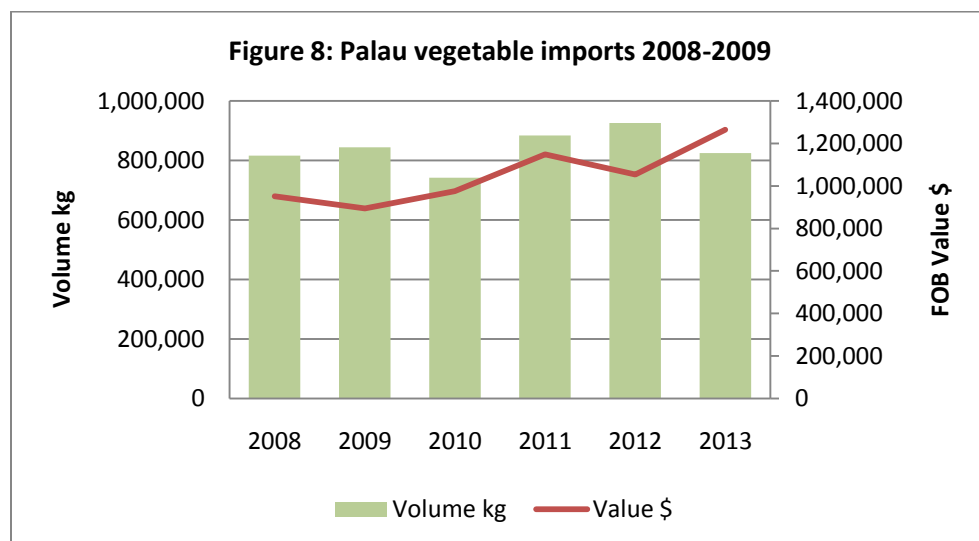
- (1) a statement of the ingredients present in the food in such detail as is prescribed*
- (2) the place of manufacture of the food;*
- (3) the country of origin of the food;*
- (4) the date on which the food was manufactured or packed;*
- (5) the date by which the food should be used or should best be used which is the date that the food may reasonably be expected to retain, without appreciable deterioration, its normal wholeness, nature and quality.*

*(c) For purposes of subsection (b) (5) above, it is an offense to sell food beyond the expiration date by which the food should be used or the date when the food should best be used. “*

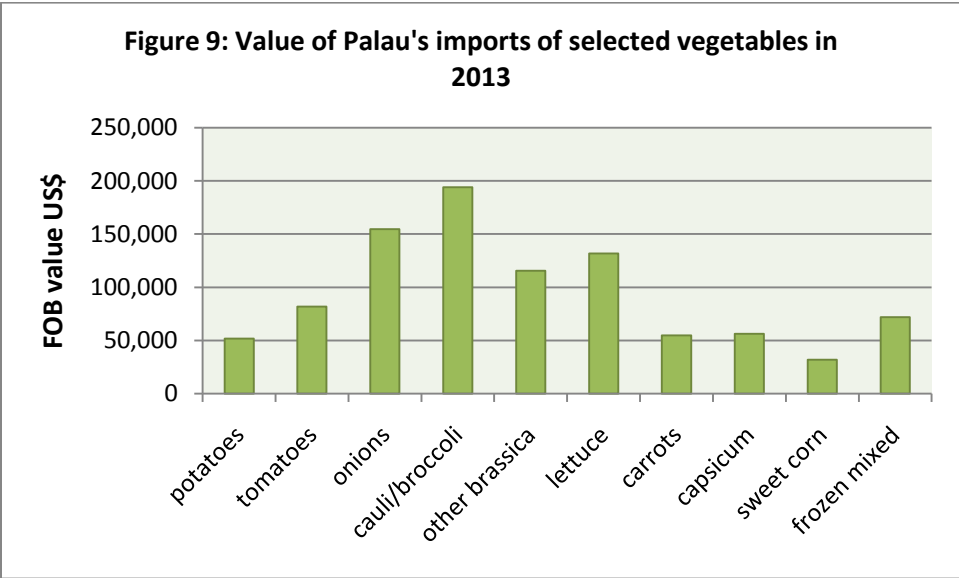
**Recommendation 2: The Division of Environmental Health should promulgate a clear ‘egg standard’ and enforce compliance to protect public health and facilitate fair trading practices.**

### Vegetables

In 2013 Palau imported about 825 tonnes of a diverse range of vegetable products valued at almost US\$1.3 million (Figure 8).



Source: Palau Customs Office, Ministry of Finance



Source: Palau Customs Office, Ministry of Finance

The volume of vegetables imported has not varied greatly over the last six years, but the value has steadily increased such that the FOB imports cost in 2013 is some 41 percent higher than in 2008. Whilst several of the categories of vegetables that constitute a significant share of imports (e.g. potatoes, cauliflower, broccoli, carrots) cannot readily be grown in Palau, some such as other brassicas (e.g. cabbages), lettuce, tomatoes, green onions and capsicums can be grown. However, without improved growing technology the quantity and quality of local production is not adequate to satisfy local domestic and tourist market demands.



Field grown lettuce and tomatoes grown under partial cover OISCA Farm, Palau

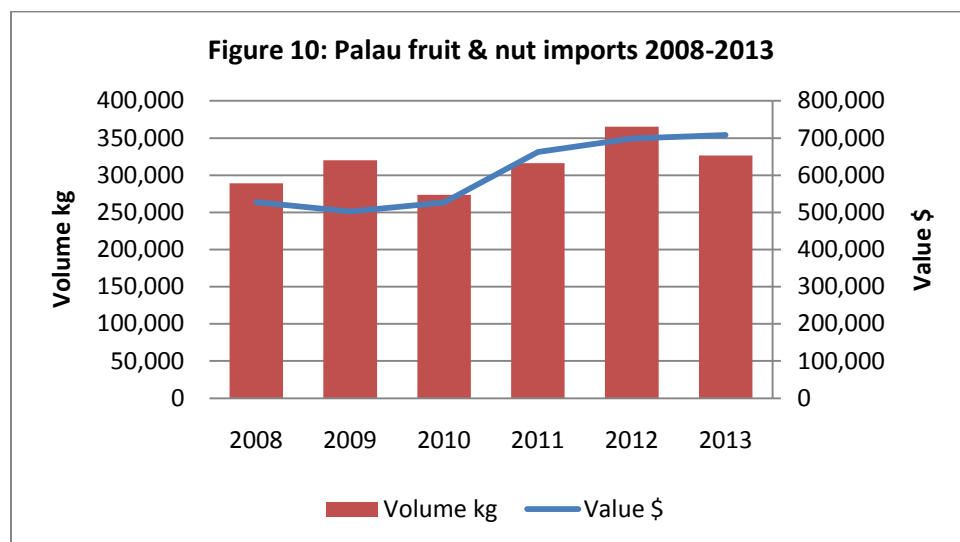


Hydroponic lettuce production in Cook Islands

There is some use being made in Palau of partial cover to protect crops such as tomato from heavy rain fall events, but there has been only a limited amount of adoption of this technology by farmers, and currently no uptake of more sophisticated growing practices such as hydroponics. Whilst good market opportunities exist for high value vegetables, to meet this demand significant investments in improved production equipment and more specialized technical knowledge will be required.

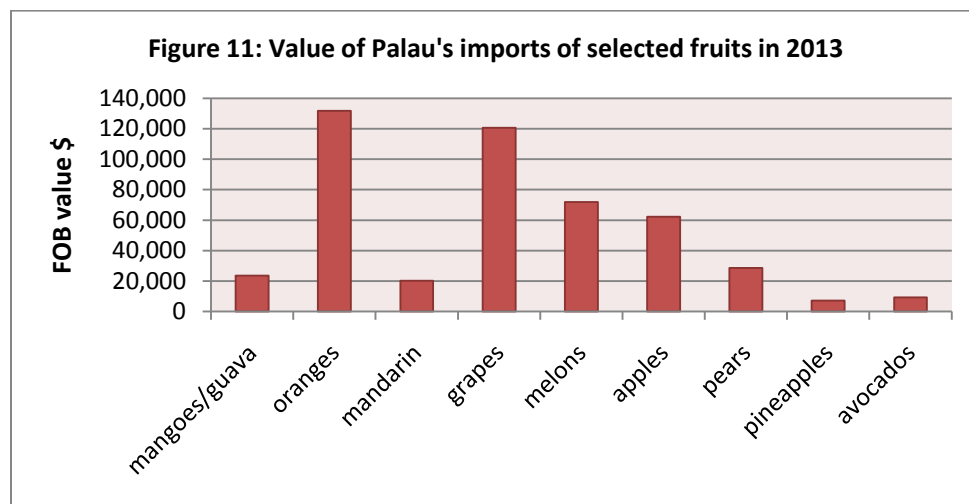
## Fruits

In the last five years Palau's fruit (and nut) imports have averaged over 300 tonnes per year and the FOB value reached over US\$700,000 in 2013 (Figure 10).



Source: Palau Customs Office, Ministry of Finance

Oranges, grapes, apples, pears and melon (mainly honeydew and cantaloupe) constitute the largest share of fruit imports with only limited amounts of tropical fruits such as mangoes, guava, avocados and pineapples being imported (Figure 11). This implies that substituting fruit imports will require both improving supply and marketing of local tropical fruits, and also efforts to increase the consumer demand for Palau's tropical fruit varieties as opposed to the more common temperate fruit varieties currently being imported.



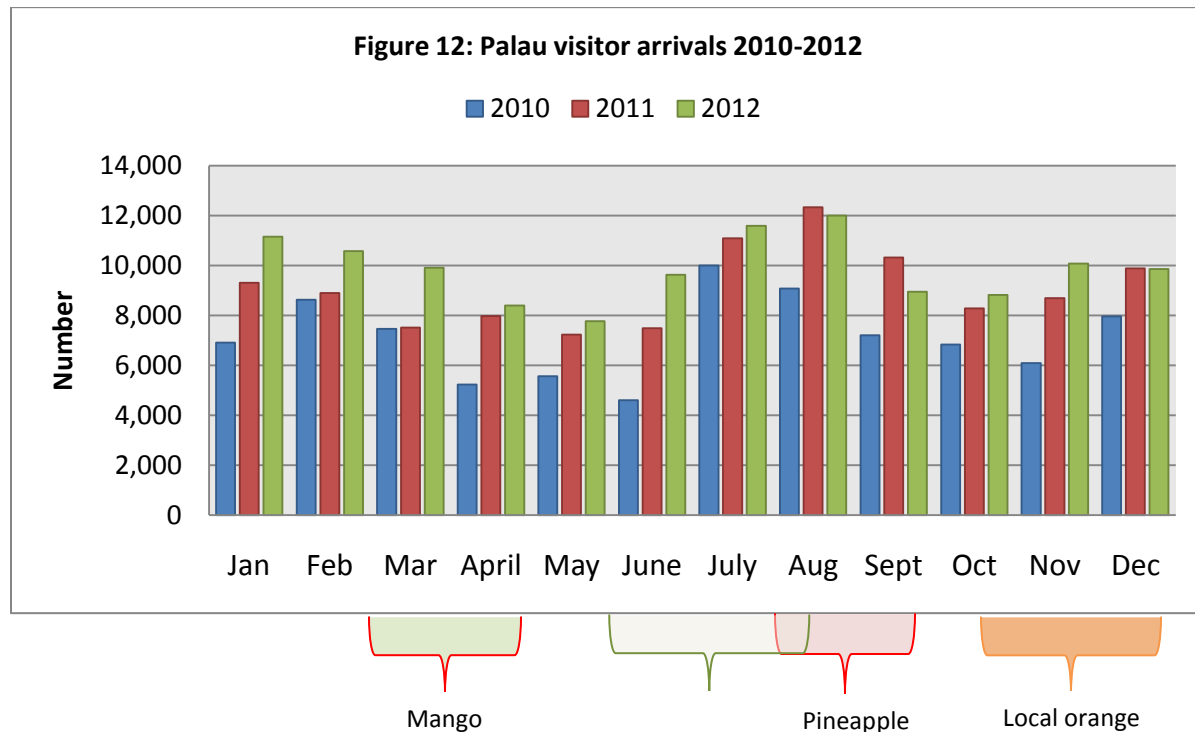
Source: Palau Customs Office, Ministry of Finance

Tropical fruits constitute a clear area where local production should be competitive to imported substitutes and are a product range that is much in demand by the tourism sector. However a major challenge to improving local fruit supply (and also fleshy vegetables such as capsicum and tomato) is the country's infestation with damaging fruit flies (*Bactrocera philippinensis* and *B. occipitalis*) which belong



to the dorsalis complex closely related to the oriental fruit fly (*B.dorsalis*).<sup>10</sup> The BOA with assistance of various technical partners has made some efforts to address the fruit fly problem, but continued funding support is needed for a longer-term concerted widespread control program based on sound crop hygiene in farming and urban areas, male annihilation techniques, and application of protein bait sprays, public awareness and vigilant quarantine surveillance. To produce quality fruit, farmers currently have to bag ripening fruits to protect them from fruit flies.

The seasonal patterns of local fruit production have been mapped and a “Palau Fruit Availability Chart” has been prepared by a consortium of local growers and experts which indicates moderate and peak availability for 49 fruit varieties growing in Palau. From this chart it is apparent that several popular fruits exhibit sharp seasonality and are only available for a limited time each year - for example, pineapple is only available for around two months in August and September, whereas the mango season is limited from March through April. However, Palau visitor arrivals average close to 8,000 per month over most of the year with peak arrivals in July and August reaching as many as 12,000 visitors per month (Figure 12). As the tourist food hospitality sector demands a consistent year-round supply of popular fruit (and vegetable) choices, it will be important for local fruit growers to address the issue of seasonality to ensure that desired fruits such as pineapples, mango and avocado are available over an extended period of the year.




The adoption of plant varieties and technologies to promote off-season production therefore presents a significant opportunity for supplying the tourist market in Palau. The technology for flower induction in

<sup>10</sup> SPC (2001) Pest Alert No. 23, Secretariat of the Pacific Community, October 2001. However some stakeholders claim that there is still uncertainty on which fruit fly species cause the most damage.

pineapples and mango using plant hormones such as Etherel is well known and quite straight forward and has been tried already in countries in the region (refer Annex 1). Etherel is currently being used regularly by farmers in Fiji to extend the pineapple season and Etherel together with potassium nitrate and irrigation water management is being used to extend the season for mango production in Cook Islands. In Samoa, it has been established that by planting a selection of six available avocado varieties it is possible to harvest fruit throughout the year (Table 2).

**Table 2: Harvest season for avocado cultivars in Samoa**

Variety	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Peters												
Nafanua-A												
Nafanua-B												
Sharwil												
Nabal												
Asau Late												

 = Main harvest season

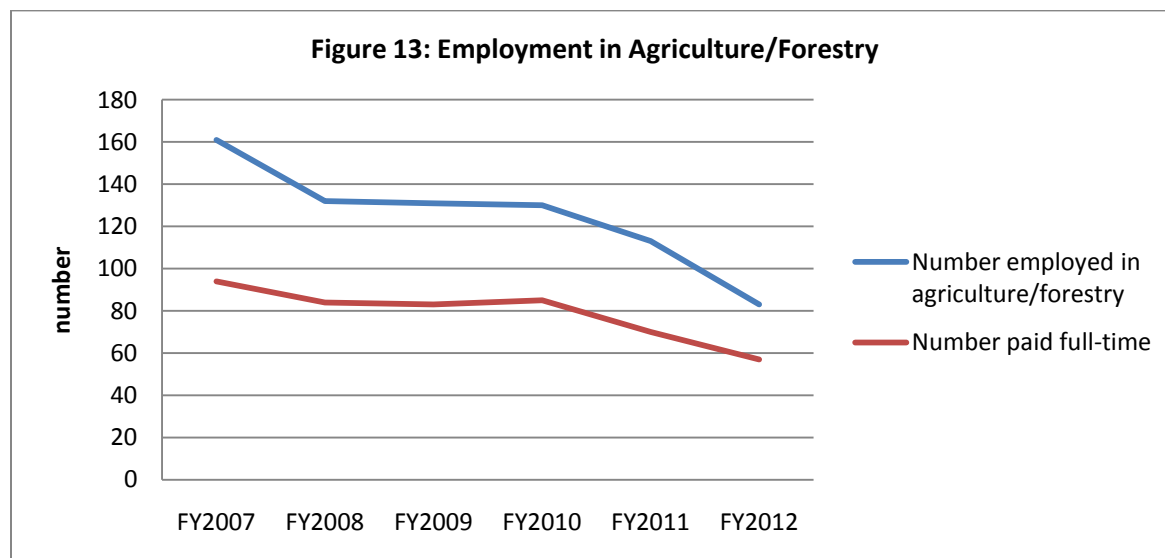
Source: Rogers S. and Thorpe P. eds. (1999) *Pacific Agroforestry: An Information Kit*, Pacific Regional Agricultural Program, SPC, Suva.

**Recommendation 3: To enable increased year-round production of quality local fresh fruit the BOA should work with the Ministry of Finance (MOF) and development partners to design and implement a long-term fruit fly control and eradication program, as well as a technical assistance package to assist farmers to extend fruiting seasons through flower induction technology and selection of appropriate varieties.**

### 3. Facilitating profitable business opportunities in agriculture

Farming is not an occupation of choice for most Palauans. According to the tabulations of the 1994 Agricultural Census, there were only 16 full time farmers in Palau, who employed 48 workers who were almost entirely foreigners – sourced from the Philippines, Bangladesh, and China. Some 20 years later, the situation appears to have changed very little; the Environmental Quality Protection Board (EQPB) provided this study team with a ‘Farm List 2012’ that is used to identify commercial farms and their operators which included 16 listed farms. Most of these farms are operated by foreigners (mainly Chinese) and most employ foreign labor (mainly from Philippines). At least three of the farms on the list are owned by government or NGO institutions (e.g. Bethania High School, Melkeok State Farm and OISCA<sup>11</sup>) and are thus not private sector farm business operations.

Social Security Administration data indicates that the number of people employed in agriculture has declined steeply over the last five to six years with only 57 people recorded as being (formally) employed in the sector and paid full-time in 2012 (Figure 13).



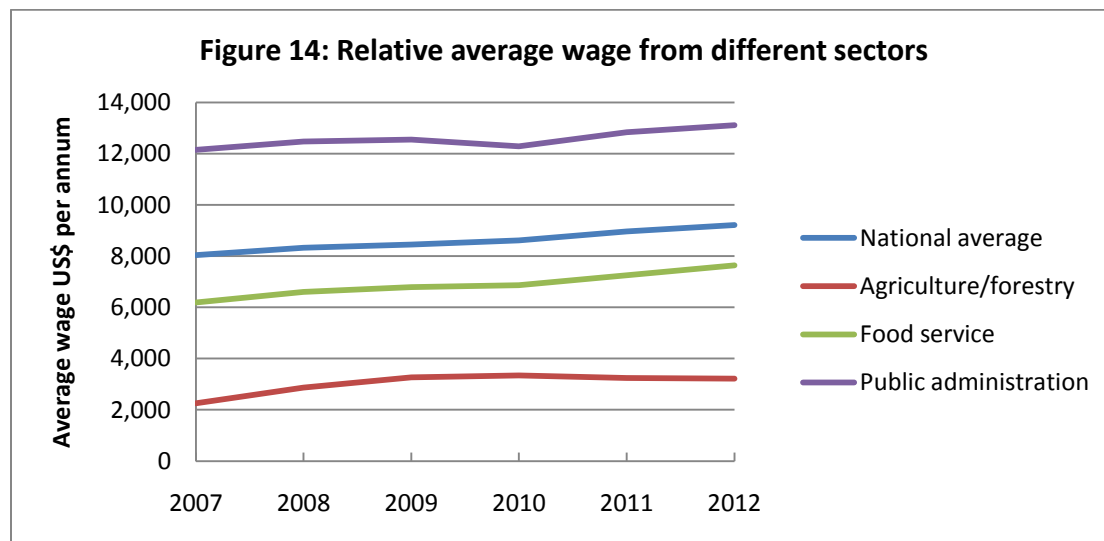
Source: Ministry of Finance 2012 Statistical Yearbook – Social Security Administration

Relative to other sectors, the average wage rates offered by agriculture are the lowest (Figure 14). Much anecdotal information indicates that Palauans consider commercial agriculture an inferior occupation which does not provide attractive (short-term) returns on investment. The relatively high wage rates in the public sector presents a more attractive choice for qualified people seeking employment and the strong growth in the tourism sector appears to provide a more lucrative opportunity for investors. The main commercial agriculture entrepreneurs, who provide most of the limited local vegetable supplies to the retail and tourist markets, continue to be migrant Chinese who are operating farms under Palauan business fronts. A key challenge for policy makers, therefore, is how to make agriculture more competitive and profitable, and thus a more attractive choice to Palauans looking for employment, and

<sup>11</sup> OISCA – which stands for Organization for Industrial Spiritual and Cultural Advancement is an NGO started in the 1980s



investment. This will require that the Palau Congress gives the sector a higher priority and ensures a policy, regulatory and institutional environment conducive for investment by small farmers.



Source: Ministry of Finance 2012 Statistical Yearbook – Social Security Administration

### Supporting a more competitive domestic supply chain

To access and compete with imported food in the higher value domestic and tourist markets, local producers will need to consistently achieve the quantity, quality, packaging requirements, delivery schedules and price points demanded by these markets. This will require local produce to obtain farm productivity gains through the adoption of more efficient farming systems, and the adoption of improved marketing systems. In order to achieve this, the public sector will need to encourage agriculture sector participants and new entrants, to make new capital investment in accessing improved production technologies, enhanced technical and agri-business advisory services, farm planning and supply chain coordination.

Having secure and clear tenure on land is vital to encourage greater capital investment in labor-saving farm equipment and improved production technologies (e.g. shade houses, covered and partially covered greenhouses, hydroponics and drip irrigation systems) and livestock housing with improved sanitary facilities. Whilst Palau does have an established process for land registration with laws that enable clear Certificate of Title and lease arrangements, accessing land for farming can still be a long and difficult process. The main problem with leasing land typically occurs when the land is owned by a clan as it is very difficult to get all members of the clan to agree to the lease terms and conditions.<sup>12</sup> Having clear title on land is also a requirement for accessing loan finance in excess of US\$10,000.

Currently there are three sources of low interest finance available for agriculture development in Palau. The National Development Bank of Palau (NDBP) provides loans at 6 percent interest which are available for agriculture development. Most loans are in the range of US\$10,000 to 200,000. Loans below US\$10,000 can be secured with a salaried income stream and/or some moveable assets, but above

<sup>12</sup> Government of Palau, The Medium Term Development Strategy 2009-2014: Actions for Palau's Future

US\$10,000 a clear title to land is required as collateral. The NDBP currently has under this loan portfolio 3 piggery farm, 4 vegetable farm and 2 milkfish farm projects. The NDBP also administers the 'Farm Loan Program' which was established by an Act (RPPL No. 9-13) signed into law by the President in August 2013. The Farm Loan Program, which has a sunset in 2018, is intended to proactively support the development of local farms (including aquaculture) and aims to integrate business development services, technical assistance and financial resources. Under this program, the NDBP offers loans of not more than US\$20,000 to qualified Palauan citizens at the rate of 3 percent interest per year. Applicants are required to have a written business plan prepared with the assistance of the Small Business Development Centre (SBDC) and the BOA, or the Bureau of Marine Resources (BMR) in case of aquaculture projects. Furthermore, the SBDC and the BOA/BMR are required under the Act to provide technical and advisory assistance to recipients throughout the life of the loan. However, since the Farm Loan Program's inception in August 2013 until May 2014, no loans had been approved. The NDBP cited lack of applicants with suitable business plans for bankable projects as the main reason for this slow uptake.<sup>13</sup>

The SBDC currently has a single staff member to undertake the herculean task of providing business support services to all business development areas and clients in Palau. Despite having some opportunity to hire local expertise as needed the SBDC clearly is operating with inadequate capacity. The BOA is also limited in its human resource capacity to provide agribusiness support to clients in the sector and does not have information readily available on farm budget and crop and livestock gross margins to assist in this process. Developing good business plans for bankable projects in agriculture is therefore proving problematic. Furthermore, the interest rate charged to NDBP on their risk capital available for lending makes the Farm Loan extended to clients at a low 3 percent interest challenging in terms of financial sustainability. The Bank would therefore welcome an injection of subsidized risk capital to support the sustainable delivery of this loan product. A further challenge to clients wishing to access a loan under this program is the requirement of clear title (in the sole names of the borrowers) to the agricultural land for the project and which is available for use as collateral.

A third source of low interest credit for agriculture development is provided by the USDA Farm Service Agency (Guam Office) which has made agreements with SBDC to support their loan clients and with the NDBP to secure collateral for loans of maximum US\$10,000 which are extended at 5 percent interest. However, the total funds available under this program are limited and are operated on a revolving basis. Currently there are four agriculture loans extended and others will only be offered once these are acquitted.

Therefore, whilst there are ostensibly good facilities for affordable finance available for agricultural development in Palau, a combination of the credit eligibility standards required by the NDBP and the lack of capacity to present sound business plans for bankable projects, is proving a significant barrier to disbursement and uptake of these loan products. Nevertheless, extending affordable finance to agricultural Small and Medium Enterprises (SMEs) will be essential to facilitating import substitution by enabling farmers to borrow to invest in purchasing the technological inputs required to increase returns to labor and land, while extending the fruit and vegetable growing seasons and upgrading livestock production systems. Consequently, it will be important to reduce the NDBP's level of risk for extending

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<sup>13</sup> Personal Communication Sandra D. Mincer, President/CEO National Development Bank of Palau, May 2014

loans by strengthening the capacity of both the SBDC and the BOA to provide the necessary business support services to small farmers, as well as helping them to identify a pipeline of viable agribusinesses capable of managing a low-interest loan. SBDC and the BOA can then work together to help agriculture sector stakeholders identify a series of 'best bet' agribusiness projects and loan applicants to make first use of the low interest Farm Loan, and thus ensure full and sustainable benefit is garnered from this program.

**Recommendation 4: The SBDC and BOA working in partnership the Chamber of Commerce and with support by partner technical agencies should put together a portfolio of bankable agribusiness projects.**

In order to assist the NDBP identify loan applicants in the agriculture sector suitable for financing, it is important to provide them with information tools to calculate the profitability of agribusiness applications, and estimate likely rates of repayment and the necessary grace periods. Similarly, in order to encourage stakeholders in the agriculture sector to invest in increasing production and productivity, it is essential to help them identify commodities offering the best rates of return on investment. Consequently, a priority for the BOA should be the production of a Farm Manual containing calculations of Gross Margins for the production of the full range of commercial fruit and vegetable crops. These margins should include some sensitivity analysis in order to enable calculation of profitability for the full range of different input and output prices commonly experienced in Palau, in order to enable calculation for both peak and off-season, and allow for fluctuations in input prices due to changes in global commodity prices.

**Recommendation 5: In order to facilitate economic and financial feasibility assessments for business planning and to strengthen the business case for loan applications the BOA should, in partnership with partner technical agencies, prepare a farm manual containing gross margin analysis and farm budgets for all key crops and livestock enterprises .<sup>14</sup>**

In order to ensure the sustainability of investments in new agribusiness ventures, and the sustainability of the low-interest loan facility, it is important to ensure that successful loan applicants have ongoing access to technical support on business practices and modern farming methods. In order to augment the BOA's agricultural extension capacity, it is essential to work with partner technical agencies to acquire technical support for a full range of improved production technologies. The SBDC, working with the Chamber of Commerce, has had some experience of providing one-on-one business mentors to stakeholders in the tourism and commerce sectors, as well as accessing online mentoring support from the US Small Business Administration network. Given the 'infant' nature of the agri-business sector in Palau it would be worthwhile to seek additional development partner support for a more substantial business mentoring program for the agriculture sector. Under such a program nascent Palau agribusiness entrepreneurs should have access to technical support from agribusinesses overseas that have experience of incorporating appropriate improved farm technologies into profitable agribusiness ventures.

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<sup>14</sup> Calculation of a gross margin is the essential first step in farm budgeting and planning. It enables you to directly compare the relative profitability of similar enterprises and consequently provides a starting point to deciding or altering the farms overall enterprise mix. It also provides a basis for determining a profitable farm gate price.

**Recommendation 6: The SBDC together with the PCOC should develop a technical assistance proposal for the implementation of a business mentoring program designed to assist loan recipients more effectively manage their agribusiness. This program would pair loan recipients with, seasoned local and overseas business owners and operators with experience of agribusiness management.**

Minimizing the tax burden on the primary sector is critical to increasing the profitability of agricultural enterprise in Palau, and therefore central to incentivising investment in local agri-business development. The Government of Palau has proposed to adopt a tax reform bill that will replace the Gross Revenue Tax (GRT) with a single rate Value Added Tax with no exemptions for locally market products. This tax will add 10 percent to the cost of all imported food as well as to locally produced food. In order to improve the price competitiveness of locally produced food against imports, it should be exempt from VAT. Such an exemption would have a minimal impact upon Government tax revenue, and help foster investment in local agribusiness.

**Recommendation 7: The BOA should work with the local agriculture sector to lobby the MOF to exempt locally produced food from any proposed VAT system.**

## 4. Improved marketing and coordination in supply and demand

### Market systems

For over a decade there has been a long unfulfilled expectation by the farming community that government would establish a permanent fresh produce municipal market in Koror, particularly as the establishment of a central market was listed as the first priority in the MTDS action plan for



PTFA farmers' market, Bethlehem Park, Koror

agriculture.<sup>15</sup> In the continued absence of a municipal market, The Palau-Taiwan Farmers' Association (PTFA)<sup>16</sup> has established a small farmers market at Bethlehem Park which is convened twice monthly on Thursdays (government paydays). Whilst this does provide a useful outlet for farmers produce (fresh and cooked foods) with most offerings being sold within a few hours of the market opening, it does not establish a permanent market outlet as an alternative to the commercial retail outlets for fresh produce sales. Consequently, most of the commercial

farmers market by direct supply to retail stores and to the food hospitality industry (hotels/ resorts/ restaurants). Under the current system, market power is firmly in the hands of the retail outlets who deal with farmers on a consignment basis – whereby the retail store sells the produce on behalf of the farmer, collecting a commission on products sold and returning unsold produce to the farmer. Under this system the farmer shoulders all of the risk and there is no incentive for the retail store to discount prices to clear stock.

Clearly, there is still a need to establish a more permanent and substantial central fresh produce marketing facility as an alternative to retail stores for farmers to market their produce more regularly. When municipal marketplaces offer a good array and quality of produce they make a major contribution to small business development and food security. Improving domestic market infrastructure as a means



Taufusi drive-through market, Samoa

to stimulate local food production and improve rural incomes therefore remains a policy priority for Palau. Farming and domestic marketing is largely the responsibility of women and they should be fully involved and leading initiatives in planning of market developments and market management. In Samoa a private sector land owner has provided a drive-through fresh produce market facility where farmers and traders can lease stalls and consumers can conveniently purchase from their car window. This has quickly become very popular with consumers and a similar model may be appropriate in

Palau. However, any market project in Palau would have to start small and expand as the production base grows to meet demand.

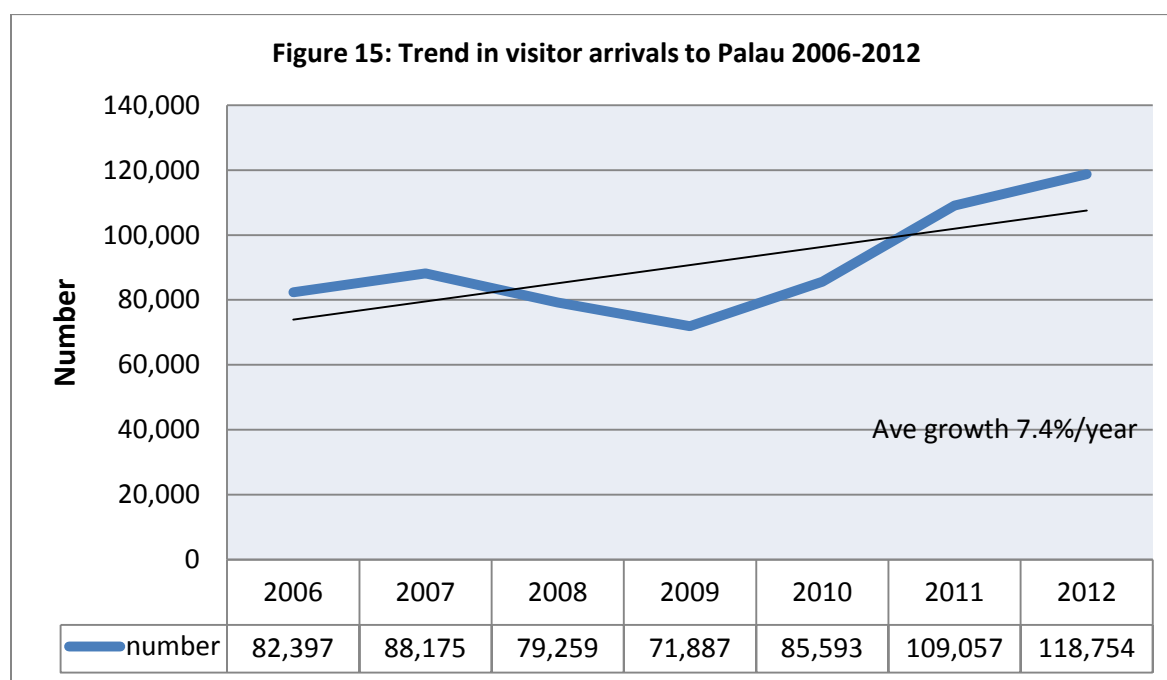
<sup>15</sup> Government of Palau, The Medium Term Development Strategy 2009-2014: Actions for Palau's Future, Matrix 20: Agriculture and Forestry Action Plan, p 177

<sup>16</sup> The PTFA Chartered in 2009 has about fifty members with approximately one third having farming as a primary income source.

## Market information

Obtaining an improved understanding of the quantity and quality demands of the different domestic and tourist market segment demands is critical to facilitating improved production planning, and ensuring improved linkages between the agriculture and tourism sectors. The paucity of market data in Palau poses a significant problem for farm planning and for coordinating supply from farmers to the main domestic market outlets and major consumers such as the food hospitality sector. Whilst over the years there have been a few ad hoc market demand surveys for farmers produce covering different retail outlets, there is no systematic collection and dissemination of market information providing farmers with information on seasonal fluctuations in market prices and demand, or providing government policy-makers with estimates of national production volumes. There is also very limited data available on tourist sector demand for fresh food produce and where the sector sources its supply, either from imports or local production. In the absence of official data, demand for fruit and vegetable products by the tourism sector was estimated using annual visitor arrival statistics together with weekly food purchase orders supplied by tourist resorts contacted by the study team.

From 2006-2012 the growth in visitor arrivals averaged 7.4 percent per year with visitor numbers reaching 118,754 in 2012 (Figure15).



Source: Palau Statistics Office, Ministry of Finance

The average length of stay for visitors varies between source market groups, but has remained fairly consistent over years for specific groups: Asians visitors stay on average 4.5 days, Americans stay 7 days and Europeans stay on average 10.5 days.<sup>17</sup> Using the average length of stay multiplied by the number of visitors from each source market group indicates that there were 580,011 visitor days in 2012, which is equivalent to around 1,589 extra mouths to feed each day of the year.

The weekly purchase order information for the Palau Pacific Resort (PPR) with 75 percent occupancy is shown in Table 3. This indicates that 71 percent of vegetable purchases (1,380 lb.) valued at \$1,636 are

<sup>17</sup> Personal Communication Sebangiol Sakuma, Balau Tourism Association.

imported, which represents 66 percent of the total value (\$2,487). Whilst a lower 63 percent (1,045 lb.) of fruit purchases are imported, these represent a higher share (77 percent) of the total value of fruit (\$2,048), because of the higher average prices of imported fruits. Local fruits are much preferred by the PPR to imported fruits because of their greater appeal to guests, freshness and lower price. The only reason a higher share of the fruit purchase is not local is because of lack of availability.<sup>18</sup>

**Table 3: Weekly Fresh produce purchased by the Palau Pacific Resort with 75% occupancy (225 guests)**

Local veg	Quantity lb.	Price \$/lb.	Cost \$	Imported veg	Quantity lb.	Price \$/lb.	Cost \$
Napa	25	1.25	31.25	Iceberg Lettuce	120	1.09	130.8
Lettuce	30	2.25	67.5	Romaine lettuce	140	1.49	208.6
Kankum	30	0.8	24	Broccoli	75	0.8	60
Long bean	50	1	50	Head cabbage	90	0.99	89.1
Egg Plant	6	0.8	4.8	Chinese cabbage	80	1.09	87.2
Raddish	50	0.8	40	Green bell pepper	50	1.75	87.5
Cucumber	105	0.8	84	Red bell pepper	75	2.49	186.75
Okra	14	0.5	7	Cauliflower	30	1.45	43.5
Green onion	35	6.45	225.75	Carrots	100	0.99	99
Sweet potato	105	1.5	157.5	Potato	250	0.75	187.5
Taro	65	1.75	113.75	Onion	250	0.89	222.5
Tapioka	45	1	45	Garlic	25	2.1	52.5
				Ginger	20	3.45	69
				Tomato	75	1.49	111.75
<b>Total veg</b>	<b>560 lb.</b>		<b>\$851</b>		<b>1,380 lb.</b>		<b>\$1,636</b>
<b>% share</b>	<b>29%</b>		<b>34%</b>		<b>71%</b>		<b>66%</b>
Local fruit				Imported fruit			
Papaya	56	0.7	39.2	Honeydew melon	125	1.39	173.75
Banana	105	0.6	63	Cantaloupe	210	1.45	304.5
Soursop	56	0.6	33.6	Grapes	20	2.65	53
Watermelon	140	0.75	108.75	Kiwi	10	2.25	22.5
Pineapple	70	1	70	Mango	10	2.99	29.9
Guava	40	1.35	54	Orange	400	1.29	516
Lemon	140	0.8	112	Grapefruit	245	1.75	428.75
				Apple	25	1.55	38.75
<b>Total fruit</b>	<b>607 lb.</b>		<b>\$481</b>		<b>1,045 lb.</b>		<b>\$1,567</b>
<b>% share</b>	<b>37%</b>		<b>23%</b>		<b>63%</b>		<b>77%</b>
<b>TOTAL local veg/fruit</b>	<b>1,167 lb.</b>		<b>\$1,331</b>	<b>TOTAL imported veg/fruit</b>	<b>2,425 lb.</b>		<b>\$3,203</b>
<b>% share</b>	<b>32%</b>		<b>29%</b>		<b>68%</b>		<b>71%</b>

The information in Table 3 was used to estimate per capita consumption and then extrapolated to

<sup>18</sup> Personal communication Alex Suzuki, Executive Chef, Palau Pacific Resort.

estimate total yearly consumption demand for vegetable and fruits by tourists (Tables 4a & 4b).<sup>19</sup>

**Table 4a: Estimated Palau tourist market consumption of selected local and imported vegetables**

Item	Price \$/lb.	7day consumption by 158 guests lb.	Estimated 7 day consumption by all tourists lb. (column 2 x 10.06)	Estimated yearly consumption by tourists lb. (Column 3 x 52)	Value of yearly Tourist consumption \$ (column 1 x column 4)
<b>Local veg</b>					
Napa	1.25	25	251.5	13078	16347.5
Lettuce	2.25	30	301.8	15693.6	35310.6
Kankum	0.8	30	301.8	15693.6	12554.9
Long bean	1	50	503	26156	26156
Egg Plant	0.8	6	60.36	3138.72	2511
Radish	0.8	50	503	26156	20924.8
Cucumber	0.8	105	1056.3	54927.6	43942.1
Okra	0.5	14	140.84	7323.68	3661.8
Green onion	6.45	35	352.1	18309.2	118094.3
Sweet potato	1.5	105	1056.3	54927.6	82391.4
Taro	1.75	65	653.9	34002.8	59504.9
Tapioka	1	45	452.7	23540.4	23540.4
<b>Subtotal</b>		<b>560</b>	<b>5,634</b>	<b>292,947</b>	<b>444,940</b>
<b>Imported veg</b>					
Iceberg Lettuce	1.09	120	1207.2	62774.4	68424.1
Romaine lettuce	1.49	140	1408.4	73236.8	109122.8
Broccoli	0.8	75	754.5	39234	31387.2
Head cabbage	0.99	90	905.4	47080.8	46610
Chinese cabbage	1.09	80	804.8	41849.6	45616.1
Green bell pepper	1.75	50	503	26156	45773
Red bell pepper	2.49	75	754.5	39234	97692.7
Cauliflower	1.45	30	301.8	15693.6	22755.7
Carrots	0.99	100	1006	52312	51788.9
Potato	0.75	250	2515	130780	98085
Onion	0.89	250	2515	130780	116394.2
Garlic	2.1	25	251.5	13078	27463.8
Ginger	3.45	20	201.2	10462.4	36095.3
Tomato	1.49	75	754.5	3958,4	58,458.7
<b>Subtotal</b>		<b>1,305</b>	<b>13,128</b>	<b>686,630</b>	<b>855,668</b>

<sup>19</sup> Consumption data was calculated using information supplied by the Palau Pacific Resort. The PPR is one of the largest hotel/resort in Palau with total capacity to sleep 300 guests. The data presented in Table 3 below has been calculated based on information provided by the PPR with 75% occupancy (i.e. 225 guests) and assuming that the resort has 70% of these guests regularly eating meals in their restaurants (i.e.158 guests). The calculation on total tourist consumption is based on a total tourist visitor arrival number of 118,754 in 2012 equating to around 1,589 tourist visitors to feed each day of the year. The amount consumed by 158 tourist guests in one week is shown in Tables 4a & b column 2. The estimated amount consumed by 1,589 tourist visitors (all tourists consumption = column 2 x 10.06) in one week is shown in column 3, and the amount consumed by all tourists in one year (column 3 x 52 weeks) is shown in column 4. The value of consumption of each product is calculated by multiplying the lb. consumption by price/lb. of the food item (column 4 x column 1).



**Table 4b: Estimated Palau tourist market consumption of selected local and imported fruits**

Item	Price \$/lb.	7day consumption by 158 guests lb.	Estimated 7 day consumption by all tourists lb. (column 2 x 10.06)	Estimated yearly consumption by tourists lb. (Column 3 x 52)	Value of yearly consumption by tourists \$ (column 1 x column 4)
<b>Local fruit</b>					
Papaya	0.7	56	563.36	29294.7	20506.3
Banana	0.6	105	1056.3	54927.6	32956.6
Soursop	0.6	56	563.36	29294.7	17576.8
Watermelon	0.75	140	1408.4	73236.8	54927.6
Pineapple	1	70	704.2	36618.4	36618.4
Guava	1.35	40	402.4	20924.8	28248.5
Lemon	0.8	140	1408.4	73236.8	58589.4
<b>subtotal</b>		<b>607</b>	<b>6,106</b>	<b>317,534</b>	<b>249,424</b>
<b>Imported fruit</b>					
Honeydew melon	1.39	125	1257.5	65390	90892.1
Cantaloupe	1.45	210	2112.6	109855.2	159290.0
Grapes	2.65	20	201.2	10462.4	27725.4
Kiwi	2.25	10	100.6	5231.2	11770.2
Mango	2.99	10	100.6	5231.2	15641.3
Orange	1.29	400	4024	209248	269929.9
Grapefruit	1.75	245	2464.7	128164.4	224287.7
Apple	1.55	25	251.5	13078	20270.9
<b>subtotal</b>		<b>1,045</b>	<b>10513</b>	<b>546,660</b>	<b>819,808</b>

This estimation indicates that the annual tourist sector demand for the selected local vegetable products is about 293,000 lb. (= 132,900 kg) valued at around US\$445,000, whilst the demand supplied from imported vegetables is almost 687,000 lb. (= 311,621 kg) valued at around US\$856,000. The highest value local vegetable markets are green onion, sweet potato, taro and cucumber; whereas the highest cost imports which could possibly be substituted with local produce are lettuce, tomato, bell pepper, head and Chinese cabbages (Table 4a).

The supply of locally produced fruit to the tourism sector is estimated at about 318,000 lb. (=144,243 kg) per annum, with a value of over US\$249,000. The supply of imported fruit products to the tourist sector is estimated at around 547,000 lb. (= 247,660 kg) per annum, valued at almost US\$820,000 (Table 4b). Overall, melons (including cantaloupe, honeydew and watermelon) constitute the highest value tourist sector fruit market. Given that the value of imported melons, oranges and grapefruits consumed annually by the tourist sector is over US\$744,000, these fruits present an important area for import substitution. The estimated annual value of fruit consumed by the tourist sector is around US\$ 1.07 million which equates to each tourist visitor consuming on average US\$1.84 worth of fruit a day during their stay.

Whilst recognizing the limitations of the above calculations of market demand, it is clear that the food hospitality sector (i.e. hotels, restaurants, cafes) is a significant consumer of fresh food produce. Comparing the estimated values of vegetables and fruits consumed by the tourist sector in 2012 with the FOB import values in 2012 (Figures 8 & 10) implies that a very significant proportion of the imported commercial supply is destined for the tourist food hospitality market. Therefore, targeting this sector with a coordinated and consistent year round supply of a diverse range of quality fresh vegetables and fruits should be given a high priority in government strategy to grow commercial agriculture and reduce import dependence.

### *Linking farmers to tourist markets*

Chinese farmers are currently the main suppliers of vegetables and some fruits (e.g. papaya, melon) to the food hospitality sector and they market their own produce through direct relationships with individual hotels, resorts and restaurants. Currently there are few, if any, 'middlemen' traders operating to coordinate (grade and sort) and link supplies to meet specific hotel/resort/restaurant demand. To strengthen market access for the relatively small group of commercial and semi-commercial Palauan farmers there is a need for trading intermediaries who can establish supply relationships with the food hospitality sector based upon their proven ability to service the sector's quality, variety and delivery needs and are able to effectively communicate these preferences to a network of supply farmers (see Box 1). In general, hotel chefs and purchasing officers prefer to deal with one or two preferred suppliers who can service most of their fresh produce requirements.

#### **Box 1: The link between farms and hotels**

Susana is a farmer and a trader who has worked for 10 years supplying the major hotels and resorts in Port Vila, Vanuatu with fruit (pineapple, melon, papaya and banana) up to three times a week. She manages her own 10ha farm and began working with surrounding farmers in order to help her co-ordinate supply, and reach the volume required to work with hotels and resorts. She thus has had a long experience in interacting with resorts and hotels, and understands their demands and preferences; as well as having experience of the constraints facing smallholder growers. Her method is to contact hotels usually on a weekly basis to pick up their order sheet indicating the products, quantities and time of delivery. She then visits her network of growers and selects and collects the required quantities and grades needed to fill the order, hires a truck and transports to the hotels. Susana has managed this business for a decade without a phone or own transport. She has established strong relationships with the purchasing officers at a range of hotels, as well as amongst her network of growers. She pays her growers weekly, and receives payment from her hotels weekly; and therefore receives produce from growers without payment up front (though advances are sometimes provided). Hotels have sought her services because she has ensured good quality and reliability.

Susana's competitive advantage is that she can procure a volume of produce sufficient to provide a return on a hired vehicle; ensure that the hotels get a higher quality produce than if they went direct to the Vila municipal market; and has developed good relationships with hotels on the basis of her ability to meet the quality and reliability standards demanded by them. She would like to improve her business and service to hotels by reducing post-harvest spoilage and waste through having a solar powered container cold storage facility.

*Source: FAO (2014) Linking farmers to markets: Improving opportunities for locally produced food on domestic and tourist markets in Vanuatu, April 2014 Study Report*

There have been some recent efforts in Palau to build an alliance between farmers and chefs supported by a project implemented by the University of Guam Cooperative Extension Service. Workshops have been organized including all stakeholders from the farming and tourism sector. The aim was to link

farmers to chefs by bringing farmers, chefs/cooks, and buyers together to learn about what produce is available, what chefs and buyers want, what to grow, and how to include more local produce in dishes. The PTFA played a key facilitating role in these activities and will continue have an important role in building alliances between the agriculture and tourism industries. But to ensure life beyond a project it is considered that a private sector driven solution through direct strategic alliances (including forward orders and firmer contracts) between the tourist sector consumers and farmer/traders will be the most sustainable route to improved coordination between supply and demand (see Box 2).

### **Box 2: Sandals Resorts - success in sourcing local food from farmers**

The Sandals Group is a large all-inclusive resort chain with properties in Jamaica, Bahamas, St. Lucia and Antigua. Their approach to developing agricultural supply linkages has been quite distinctive, going beyond just increasing their own demand for local products.

Sandals' Farmer Program in Jamaica began in 1996, with the aim of developing good working relationships between farmers and hotels by improving the quality of produce, developing proper pricing arrangements, and improving communications between farmers and hotels. Thus the initiative works across supply, demand and marketing. Key elements of the approach include:

- ✓ A farmer extension officer, funded by Sandals, who works directly with farmers on improving production.
- ✓ Collaboration with various other organizations, particularly on agricultural support, including the Rural Agricultural Development Authority (RADA) and Continuing Education Program in Agricultural Technology (CEPAT).
- ✓ Hotel management staff visit farmers, holding and attending workshop days with them to discuss quality and marketing procedures. Farmers visit the hotels to see how their products are being utilized and why Sandals' specifications are important.
- ✓ A focus on improving pricing and contractual arrangements concerning volumes to be traded.

Problems have also been encountered. The initial problems for farmers were a) problems relating to production (e.g. lack of water supply; lack of packing material); and b) problems relating to sale of the produce (e.g. inconsistent supply orders; lack of communication). RADA played an active part in ensuring that the communication lines were active and the hotels were being informed two weeks before the delivery date as to what crops and volumes are available, thus guaranteeing supplies to the hotels while informing the farmers of demand in due time. In addition, a list of types, volumes and delivery prices of produce was agreed to by individual hotels and the respective farmer groups. This corresponded to a monthly supply order. Despite initial problems, progress has been made. The project began with ten farmers supplying two hotels, but increased to involve 80 farmers across the island; and sales rose from US\$60,000 to \$3.3 million within three years. Farmers' income increased and became more reliable, while hotels have gained from a wider variety of good quality local produce and cost savings. The program subsequently expanded to St Lucia and Antigua.

Source: [\*Pro-Poor Tourism, Brief No 3, ODI, UK\*](#)

In order to improve the co-ordination of supply to the tourist sector, it is critical to combine improved market intelligence with better farm production planning. Participants in the tourism industry with an interest in increasing their use of locally produced food, such as PPR, should be encouraged to supply 'demand forecasts' for fruit and vegetable products, to agriculture sector stakeholders. These demand forecasts should be developed using weekly food order sheets, combined with information on forward bookings, in order to identify the future volume of demand for select fruit and vegetable products for each of the main hotel/resorts, at least 6-months in advance. The Palau Visitor Authority (PVA) could work with the Balau Tourism Association (BTA) and Palau Chamber of Commerce (PCOC) to collect this

information and provide it to the BOA and PTFA to provide to reliable growers, so that they could better plan their production around this unmet demand.

**Recommendation 8: The PVA and the BTA should work together with the PCOC and the BOA and the Palau-Taiwan Farmers Association (PTFA) to develop a pilot scheme for collecting forecasts from participating hotels and retail outlets, of their future demand (quality and quantity) for select fruit and vegetable products, and sharing it with their members in order to help them plan their production, and co-ordinate supply to this sector.**

### *Marketing Palau as a high-end tourism destination*

In order to provide for a sustainable “world-class” tourism industry that primarily benefits the people of Palau, the government has declared a policy to promote Palau as a high-end tourism destination with a high quality tourism product that is environmentally friendly. To deliver this policy the Bureau of Tourism (BOT) has been established under the MNRET by Executive Order No. 357 to be the lead regulatory agency and develop standards for tourism. Additionally, a draft Bill for an Act has been prepared to establish Palau Visitor Authority (PVA) as a nonprofit public corporation in order to carry out the purpose of this policy. It is anticipated that The BOT, PVA, BTA and PCOC will work together in the promotion of high end tourism in Palau.

Palauan  
Night Market  
Featuring  
NGEREMLENGUI STATE



APRIL 18, 2014  
BETHLEHEM PARK  
5:00 PM to 9:00 PM



Source: PVA website

Whilst Palau has already established itself as “world-class” diving resort, it could further boost high-end tourism by promoting the destination through a distinctive local cuisine experience. Particularly, as the quality and variety of cuisine on offer at a destination is becoming increasingly important to defining the tourist holiday experience. Visitors want to savor the foods and flavors of Palau especially the tropical fruits, fish and other local fresh produce and culinary dishes. Good quality fresh local food enhances the visitor stay and improves probability of return visits. Therefore, promoting local food will be an essential aspect of any strategy for growing the high-end market share for Palau as well as for increasing the demand for local fresh produce.

The PVA is currently supporting an on-going effort to promote Palau’s tourism by hosting an International Night Market and a Palauan Night Market each month where local culture, crafts and cuisine are show cased to visitors. Developing a promotional campaign which offers additional marketing benefits for tourism operators committed to offering local cuisine experiences to guests, would be another strategy for encouraging greater demand for local produce by the food hospitality sector. This could possibly be coupled with an accreditation system that identifies hotels/resorts/restaurants that provide a quality local cuisine experience with high local fresh produce content. Increased demand for improved ‘cuisine experiences’ from restaurant clientele and guests will be a strong

driver for tourism operators to make additional efforts to use more local food content.



Palauan *Demok* – taro soup

To facilitate this it will also be necessary to strengthen the training of local chefs towards the development of menus offering unique dishes utilizing local ingredients. To do this the Palau Community College Tourism and Hospitality School will need to take a lead role and build capacity in the Food and Beverage Department to support appropriate training programs for chefs.

**Recommendation 9: The PVA together with BTA and PCOC should build a promotional campaign around the use of local fresh produce in the food and beverage experience in Palau by inviting tourism operators and chefs who are particularly innovative in their use of local food to identify some initiatives to help differentiate the Palau tourism brand as a destination offering a unique ‘cuisine experience’. The BOT should investigate the potential for using an accreditation process that identifies tourism operators that provide a quality local cuisine experience with high local fresh produce content.**

## 5. Improved co-ordination of policy and regulatory reform

Establishing the policy and regulatory settings and institutional service provision necessary to reduce Palau’s heavy dependence on food imports and strengthen food security, will require a coordinated effort reaching across many areas of government responsibility. It will also need to include a strong voice from the private sector (farmers, fishers, traders, retailers, processors, food service and hospitality etc.) and civil society. Therefore, there is a critical need for the establishment a formal forum where key stakeholders from government, the private sector and civil society can come together to identify and lobby for the policy and regulatory reforms which are necessary for achieving import substitution, tackling the NCD health crisis, encouraging local agri-business development and protecting the sustainability and equity of Palau’s food system. The Ministry of Natural Resources, Environment and Tourism (MNRET) which includes the key government responsibilities for agriculture, marine resources, environment and tourism, should lead a process working with the Ministries of Finance, Health and Education to establish a statutory body such as a “Food Policy Council”<sup>20</sup>. Closely involving the Office of the President in this process will be critical to ensure leadership credibility across multiple disciplines enabling them to form coalitions to develop a coherent set of policy and regulatory reforms necessary to strengthen food security in Palau. The Food Policy Council would therefore play a critical role to guide a more coordinated and holistic approach to address the many inherent constraints that are holding back the development of the agriculture sector.

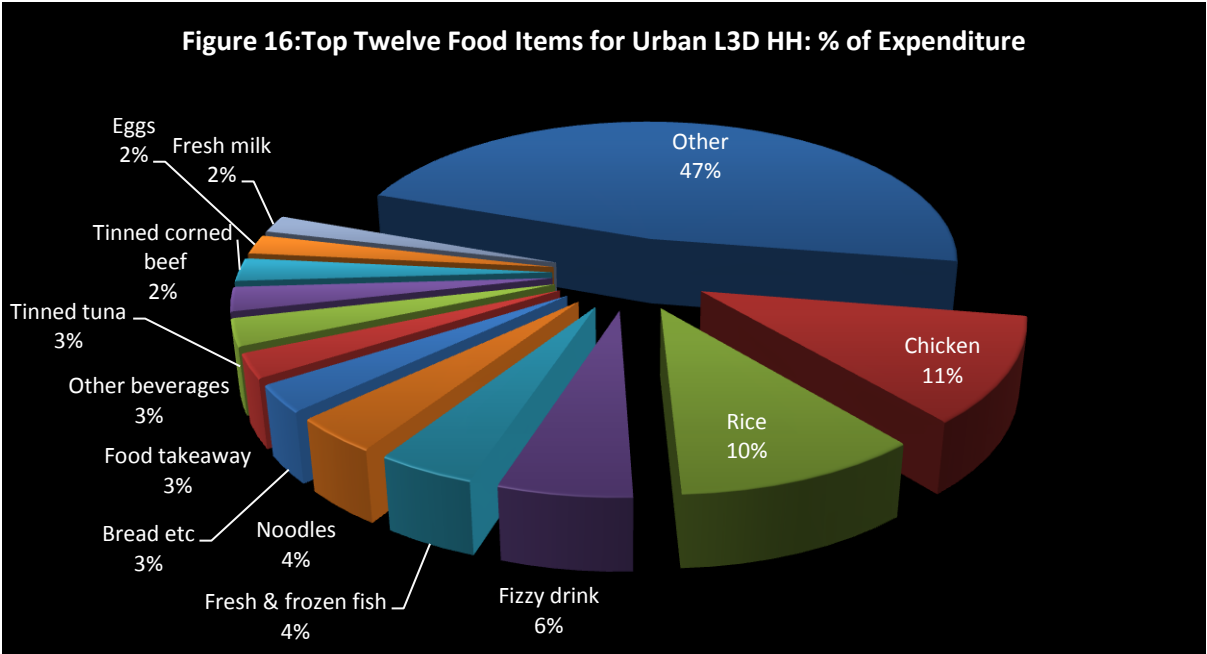
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<sup>20</sup> The Food Policy Council model has emerged in North America over the last three decades as an attempt to address inadequacies and gaps in the food policy arena. One of the principle problems of food system planning is the way policies that impact the food system are scattered across a disparate array of government departments and agencies without coordination or recognition of the linkages between food related sectors.

**Recommendation 10: The MNRET should join with the Ministries of Finance, Health and Education and the Office of the President to facilitate the establishment of Food Policy Council with mandate to design and implement whole of government policy measures to address the strategic issues common to food production and consumption trends in Palau; and to enhance co-operation between the public and private sectors to ensure a sustainable, healthy and equitable food system.**

*Enhancing synergies between health and agriculture policy*

Non-Communicable Diseases (cardiovascular disease, cancer, chronic respiratory disease and diabetes) are a major concern in Palau being responsible for nearly 80 percent of deaths and consuming more than 50 percent of the health budget. Without action, premature death, productivity losses and the burden of health care costs due to NCDs will erode gains in health and socio-economic progress.<sup>21</sup> Unhealthy diets, overweight and obesity, increased tobacco and alcohol use, and reduced physical activity are the major NCD risk factors. Globalization and urbanization have seen a transition in diets in Palau with increased consumption of carbohydrate dense processed imported foods high in salt, fat and sugar content. The top 12 food items purchased by Palau’s lower income urban households are show in Figure 16. This data, collected from household food diaries and reported in the 2006 Household Income and Expenditure Survey (HIES), clearly illustrates the predominance of imported processed foods (including noodles, canned foods and fizzy drinks) and the dearth of local produce in the main foods families are consuming.



Source: Palau Analysis of the 2006 Household Income and Expenditure Survey, Palau Office of Planning & Statistics and UNDP Pacific Centre, Suva, Fiji, 2008.

Palau declared NCDs as a national emergency in 2011 and has put a number of programs in place to encourage lifestyle changes related to reducing tobacco use and alcohol consumption, purchasing fresh

<sup>21</sup> Republic of Palau Non-communicable Disease Prevention and Control Strategic Plan of Action 2015-2020, Draft copy dated 20 April 2014.

food rather than imported and increasing exercise levels. To improve overall nutrition the Palau draft Non-Communicable Disease Prevention and Control Strategic Plan of Action 2015-2020 sets specific targets by 2020 to reduce salt intake by 30 percent and increase fruits and vegetables intake by 50 percent. Two of the key actions to achieve these targets are: (i) to legislate taxes on imported food products that are high in sodium, fat and sugar; and (ii) to pursue a nationwide policy that mandates provision of healthy meals in all public and private schools.

The critical importance in addressing food consumption habits of children has been highlighted by a 12 year longitudinal research study in the United Kingdom that investigated the links between diabetes, obesity, diet and exercise in a group of over 200 children. The results of this study clearly indicate that the primary factors linked to obesity and increased incidence of diabetes is the kind of food and the quantity (portion size) of food consumed.<sup>22</sup> Furthermore, these researchers have challenged the assumption that a lack of exercise causes children to put on weight. Indeed, this study suggests that the effect is the other way round – obesity leads to inactivity, rather than inactivity leads to obesity. Whilst there is no suggestion that exercise is not good for children, the policy implications from this research are far-reaching indicating that nutrition (and calorie reduction), rather than increased physical activity is the key to tackling childhood obesity. The main conclusion from this work is that programs to tackle obesity (and hence diabetes) need to focus more on food.

Research into the links between poor diet, obesity and increased risk of developing Non-Communicable Diseases over the last three decades, has led a number of constituencies to introduce levies on foods and beverages with high sugar, salt and fat content<sup>23</sup>. The result of these levies indicates that the best way to encourage healthy eating is to use revenue collected from public health taxes to make healthy substitute products cheaper, or more available<sup>24</sup>. Furthermore, research has found that the price of a product would need to be increase by at least 20% in order to make an impact on consumption volumes<sup>25</sup>. Therefore it is suggested that an excise tax could also be levied on foods with high salt, fat or sugar content and the revenue collected directed to improving access to affordable fruits and vegetables. This could be achieved by using the revenue collected to increase agricultural productivity and off season fruit and vegetable production; either by the provision of a sustainable source of risk capital for the Farm Loan Program, or by directly providing funds to support the ongoing program to control and eliminate damaging fruit flies which limit fruit production in Palau.

Below in Table 5, we present evidence of the potential revenue raised by an ad valorem import excise levied at the rate of 20 and 30 percent on a sample of 6 food products deemed to be very high in salt and/or saturated fat by nutritionists (see Annex 3 for full details). This example demonstrates that if a tariff of 20 percent was applied to just these 6 food products – canned beef; spam; hot dog franks; instant noodles; butter; and cheese it would be sufficient to collect around US\$ 465,000 for programs to fight obesity, and improve the health of the nation. If the levy was raised to 30 percent then this would generate revenue of over US\$700,000 that could be used for such worthwhile programs.

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<sup>22</sup> Metcalf, B.S., Hosking, J., Jeffery, A.N., Voss, L.D., Henley, W., Wilkin, T.J. (2011). Fatness leads to inactivity, but inactivity does not lead to fatness: a longitudinal study in children (EarlyBird 45). *Arch Dis Child*, 96(10), 942-947

<sup>23</sup> Thow et al., 2010

<sup>24</sup> Horgen, K.B., Brownell, K.D., 2002

<sup>25</sup> Myton et al., 2012

**Table 5: Potential revenue collected from six sample food products subject to a 20 & 30 percent health excise levy**

Product	HS Code	Value (FOB) 2013 US\$	Revenue from 20% excise US\$	Revenue from 30% excise US\$
Canned beef	1602.50.00	504,143	100,829	151,243
Spam	1602.40.00	560,065	112,013	168,020
Franks/sausage	1601.00.00	570,038	114,008	171,011
Instant noodle	1902.30.00	259,685	51,937	77,906
Butter	0405.10.00	60,181	12,036	18,054
Cheese	0406.	386,746	77,349	116,024
<b>Total Revenue</b>			<b>468,171.6</b>	<b>702,257.4</b>

Currently Palau Customs apply an import tariff on sweetened carbonated mineral waters (products in HS Code 22.02) at the rate of US\$0.28175 per litre.<sup>26</sup> This tariff levy, based on 2013 imports of 1,149,239 litres of sweetened carbonated drinks, raised revenue of just over US\$ 321,000.<sup>27</sup> In contrast, the Cook Island’s Government has recently implemented a health tax based on sugar content targeting the same product range at a rate of NZ\$8.60 (approx. = US\$7.47) per kg of sugar. This would imply a levy of around US\$0.85 per litre on Coke or similar drink<sup>28</sup>, which is about three times the tariff level currently applied on these products in Palau. If Palau was to implement a similar health based sugar excise it could raise additional revenue of over US\$ 600,000.

The potential revenue collected from health excises levied on salt, fat and sugar would go some way towards paying for programs to encourage consumption of healthier substitute products, such as fruit and vegetables.

**Recommendation 11: The Ministry of Finance together with the Ministry of Health and BOA should lead the consultation for and implementation of a ‘health excise’ on food products with a negative impact on NCDs, and the identification of priority programmes for facilitating improved access to healthier substitute products.**

### *Palau school lunch program*

The Palau school enrolment in 2012/2013 school year was 3,327 (2, 174 students in elementary schools and 1,153 in secondary schools).<sup>29</sup> Children attending public schools are entitled to receive a free school lunch funded from the government budget.<sup>30</sup> The Ministry of Education (MOE) Food Services in Koror

<sup>26</sup> Ministry of Finance, Palau Customs Tariff Schedule 2012

<sup>27</sup> Data for 2013 imports by tariff item was provided by Palau Customs Office, Ministry of Finance

<sup>28</sup> 1 litre of Coke contains 114g of sugar.

<sup>29</sup> Ministry of Finance 2012 Statistical Year Book, Republic of Palau – Bureau of Budget and Planning

<sup>30</sup> Personal communication Kyonori Tellames, Ministry of Finance



have tendered the school meal preparation for Palau Secondary School (about 500 meals per day costing US\$3.25 per meal) to three vendors who provide this service on a 5-day rotating schedule. Lunch menus are pre-agreed with the providers by the MOE. For 12 elementary schools (about 1,681 students) located in Koror and the states on Babeldaob, the MOE Food Services prepares the monthly menus and centrally purchases, from one main supplier, food for the school lunches. This food is then distributed by the MOE to the schools on a weekly basis. The schools are responsible for preparing meals in line with the prescribed menus. The menus vary very little over the year and a typical school lunch menu for five days is shown in Table 6 below.<sup>31</sup> What is striking is the prevalence of imported processed canned food ingredients in the school lunches. Many of the vegetables and fruits (e.g. sweet corn and pineapple) are also sourced from imported cans. Notably, the meat products which are common in the menus (e.g. corned-beef, luncheon meat and hot dogs) are ones which are particularly high in salt and saturated fats. The MOE does not have a nutritionist to advise on a healthy menu choice and needs therefore to work more closely with the Ministry of Health NCD Unit which has the services of a qualified nutritionist.

**Table 6: Example weekly school lunch menus (source: MOE Food Services)**

MON	TUE	WED	THU	FRI
Rice- steamed Corned-beef sautéed w/ sweet corn Chilled water	Rice-steamed Tuna sautéed w/ cucumber chilled water	Rice-steamed Chicken soup w/ cabbage chilled water	Rice-steamed Luncheon meat grilled Pineapple Chilled water	Rice-steamed Hot dog boiled w/ ketchup sweet corn chilled water

A real opportunity exists to improve the nutritional quality of the school lunches and to make this a flagship program in the fight against NCDs. Increasing the proportion (say to 50 percent) of local fresh produce in the lunch content has the potential to improve the nutritional quality of the meal as well as providing a significant market for local farmers' produce. However, to achieve this will require a redesign of the system of procurement, distribution and payment currently being used for the school lunch program. Decentralizing the purchase of local fresh produce to enable schools to purchase directly from local farmers would represent an important reform, as it would reduce storage and marketing costs. Under the current payment system, MOE suppliers can wait for several months to receive their payment. This would not be conducive to making purchases directly from small farmers. A workable alternative may be for the PTFA to develop a network of farmers who could work together to supply on a regular basis all the schools with the fresh produce ingredients needed for the lunch program. A forward supply contract signed between the MOE and the PTFA network could be sufficient collateral to allow the NDBP to provide credit for working capital to the farmers.

**Recommendation 12: The Ministry of Health NCD Unit should lead a process together with the MOE, the BOA and the MOF to review the school lunch program and provide a healthier menu choice including more local fresh produce (fruits and vegetables) and redesign the procurement and distribution system for the food to facilitate increased purchasing from local farmers.**

<sup>31</sup> Weekly menus for the school lunches for 2013 were provided by the MOE Food Services Division

## 6. Conclusions

Palau's dependence upon imported food leaves its households in a state of relative food insecurity. As a result, food import substitution has been prioritized by the Government of Palau in its national development strategy. However, local agricultural activity remains small-scale with limited commercial capacity to substitute imports. To address the many inherent constraints that are holding back the development of the agriculture sector the government will need to employ a more coordinated and holistic approach to reforming the policy, regulatory and investment environment required to facilitate growth. This should begin with setting a supportive policy and regulatory framework that encourages investment and innovation in agri-business development in Palau.

This study has estimated that the tourist sector consumes annually fruit and vegetables valued at around US\$2.4 million, and that 70 percent of this produce is imported. Therefore, targeting this sector with a coordinated and consistent year round supply of a diverse range of quality fresh vegetables and fruits should be a key government strategy to grow commercial agriculture and reduce import dependence. To achieve this, Palauan farmers will need to be able to access affordable development finance to invest in upgrading farm technology and be supported by sound technical and business advisory services. Recognizing that business enterprise capacity in the sector is not high, business enterprise and entrepreneurship skills need to be fostered through provision of a business mentoring program to the agriculture sector.

Facilitating farmers' access to local markets will require better market infrastructure, improved market intelligence and the formation of strategic alliances between hotel chefs/purchasing officers, local suppliers, farmers and service suppliers from government, NGOs and the private sector. Demonstrating the strong marketing benefits from increased utilization of local food by the tourist industry will further boost demand for local farm produce.

Effectively limiting the escalation in obesity and NCD rates in Palau will require the introduction of targeted policies aimed at redressing the food price incentives faced by consumers, which at present encourage the consumption of food products which result in poor nutrition outcomes. Reducing the cost of local fruit and vegetables, through the facilitation of increased investment in the adoption of productivity enhancing technologies, and improved coordination of production and food marketing, is critical to winning the battle against NCDs.

The political and institutional dimensions of policy formulation and implementation are key determinants of the feasibility of technical policy recommendations. Strengthening food security in Palau will be dependent on coordinated multi-sector interventions, improved policy coherence and the ability to resolve conflicts of interest. This will require a forum such as a "Food Policy Council" that can bring together a diverse range of stakeholders united in their interest to transform the food system in Palau through collaborative policy making.

## Annex 1: Summary of the key actions to realize opportunities for locally produced food on domestic and tourist markets in Palau

Action Area	Specific Action	Responsibility	Possible Partners
Improved production & productivity	1) Establish a viable business model for the livestock feedmill operation.	BOA; PTFA	TTM, FAO
	2) Promulgate a clear standard for egg production and sale	Division of Environmental Health; BOA	FAO
	3) Identify funding source and implement a long-term control and eradication program for fruit fly	BOA; MOF	TTM; SPC; FAO
	4) Transfer knowledge and facilitate access to technology for “off-season” fruit and vegetable production.	BOA	TTM;FAO
	5) Provide business skills training and mentoring support to agriculture entrepreneurs	SBDC; BOA; PCOC	USDA FSA; FAO
	6) Prepare gross margin for all key crops & livestock and farm budget information in order to facilitate economic and financial feasibility assessments to strengthen business planning	BOA	FAO; SPC; TTM
	7) Develop a portfolio of bankable agribusiness projects	SBDC, BOA, PCOC	FAO
	8) Advocate for the exception of locally produced food from any proposed VAT	BOA;PTFA	
Improved market co-ordination	1) Collect tourist sector demand information on fresh produce needs and use this to build strategic supply chain alliances	BTA; BOA;PCOC	
	2) Build a promotional campaign around the use of local fresh produce in the Palau cuisine (food & beverage) experience	PVA; BTA	SPTO
	3) Investigate the potential for using an accreditation process that identifies tourist operators that provide a quality local cuisine experience	BOT;PVA;BTA	SPTO
Improved policy coherence	1) Establish a statutory “Food Policy Council” in order to co-ordinate the implementation of policy and regulatory reforms required to achieve improved food import substitution and strengthened food security	MNRET;MOF;MOH;MOE Office of the President	FAO
	2) Develop a proposal for the implementation of border health excise levies based on salt, fat and sugar content of foods with a view to reducing consumption and raising revenue which can be directed to encourage production and consumption of cheaper healthier substitute products	MOF; MOH; BOA	FAO; WHO; SPC; PFTAC
	3) Review the school lunch program to provide a healthier menu choice and redesign the procurement and distribution system to encourage greater use of local fresh produce	MOH NCD Unit; MOE; BOA; PTFA	WHO; FAO

ACRONYMS: BOA – Bureau of Agriculture; BOT – Bureau of Tourism; BTA – Belau Tourism Authority; FAO – Food & Agriculture Organization; MOE – Ministry of Education; MOF – Ministry of Finance; MOH – Ministry of Health; MNRET – Ministry of Natural Resources, Environment & Tourism; PFTAC –Pacific Financial Technical Assistance Centre ; PTFA – Palau-Taiwan farmers Association; PVA – Palau Visitor Authority; SPC – Secretariat of the Pacific Community; SPTO – South Pacific Tourism organization; TTM – Taiwan Technical Mission; USDA FS United States Department of Agriculture Farm Service Agency; WHO – World Health Organization

## Annex 2: Artificial flower induction in pineapple

Natural flowering in pineapples varies from year to year in a producing region. Research indicates that natural flowering is linked to the seasonal drop in temperatures which triggers flowering. Dependence on natural flowering can result in serious loss of revenue as seasonal climatic variations cause erratic flowering and varying maturity times. This increases crop management costs and affects the time and quantities of pineapples for sale. Pineapples can be induced to flower and fruit by the use of certain synthetic compounds. The materials used for artificial flower induction all induce the generation of ethylene which acts as a hormone to trigger flowering in the pineapple plant if the plant is physiologically mature.

Artificial flower induction can facilitate better scheduling of harvest because it promotes uniform flowering and maturity in the fruits and increases fruit size and quality. Producers use this practice to:

- Attain uniform maturity; in a mixed planting, ratoon plants and first crop plants can be brought into fruiting with the rest of the crop.
- Control the time of harvest; treatments can be timed to produce a harvest at a predetermined date.
- Avoid overproduction in the peak periods.
- Maximise yields.

Plants are induced when they are on average 8 – 10 months old and at the 30-leaf stage or older. From induction to full maturity takes about 5 months. Applications should take place during the cooler periods of the day e.g. early morning or late afternoon, with preference for the latter. The application is repeated 1 week later to ensure maximum inducement.

The main materials used to induce flowering are Naphthalene Acetic Acid (NAA), calcium carbide and Etherel.

NAA is available in tablet form and treatment is achieved by placing ½ or 1 tablet into the centre of the whorl of each suitable plant.

Calcium carbide is used by dissolving a 100 g piece in 5 L water (Plate 30) and, after effervescence has subsided, applying 50 cc to the centre of the whorl of the plant. The solution should be used within 3 hours of mixing.

Etherel is available in liquid form and is used as a 0.1 - 0.2% spray solution which is applied to the centre of the whorl of the plant.



Source: *Caribbean Pineapple production and Post- Harvest Manual*, FAO and CARDI, 2011.

## Annex 3: Model of a health tax based on fat and salt content

### What foods should a 'health tax' target?

According to the Australian and New Zealand Food Standard Code (FSC), a balanced diet (8700 kilojoules) for an average adult should include no more than the following levels of daily intake of saturated fat, sugar and sodium (<http://www.foodstandards.gov.au/code/Pages/default.aspx>):

- Sodium – 2300 milligrams
- Saturated Fat – 24 grams
- Sugar – 90 grams

Health authorities (USDA) considers that a serving of any food item which contains more than 20% of the recommended maximum daily intake of that ingredient, is considered to contain a high-level of that ingredient, and should be consumed only in moderation. However there are a large number of foods containing far more than this rate, and their consumption could therefore beneficially be reduced through the use of a tax.

Research into the impact of fat taxes shows that the price of a product would need to increase by at least 20% in order to make an impact on consumption volumes (Myton et al 2012). In this example we look at the revenue raising impact of the introduction of a tax that results in a 20% and a 30% increase in the price of a sample of food products deemed to very high in salt or saturated fat by nutritionists. For the purposes of this study we have selected 6 products commonly consumed and available in Palau stores: tinned corned beef (Palm); tinned ham product (Spam); Hot Dog Franks (Bar-S); instant noodles (Maggi); (Western Family) cheddar cheese; salted butter. A full description of the nutritional content of each of these products is included at the end of this Annex.

In order to compare the contents of each product, we select 100g as a sample serving size. While many products display a serving size that is lower than 100g, this often obscures the serving sizes being consumed in the Pacific Islands and their real impact on health. Thus we used 100g as the standard size in order to provide a comparison between products. We highlight in the table below any product for which a 100g serve contains more than a third (33%) of recommended daily intake (RDI) of salt or saturated fat. Five of the six products - canned corned beef; canned spam; hot dog franks; cheddar cheese; and salted butter – pass the threshold for saturated fat content, and three products –canned spam, hot dog franks and noodles- pass the threshold for salt. Therefore all six products have been selected to be subject to a health tax.

Table: Contents of 100g serve of select food items				
Food item	Saturated Fat content		Sodium Content	
	Grams	% DRI	Milligrams	% DRI
tinned corned beef	8.4	35	630	27
tinned ham product	10.5	53	1383	60
Hot dog franks	8.4	35	904	39
Instant noodles	7.5	31	1188	60
cheddar cheese	21	87.5	621	26
salted butter	51.36	257	643	28

Using 2013 official national import data, providing the total volume and FOB value of each of these products that was imported into the country that year, we can investigate what revenue would be raised by applying a 20% & 30% ad valorem excise tax to imports of these products. The results are presented in Table 5 in the main body of the report and copied in the table below.

Product	HS Code	Value (FOB) 2013 US\$	Revenue from 20% excise US\$	Revenue from 30% excise US\$
Canned beef	1602.50.00	504,143	100,829	151,243
Spam	1602.40.00	560,065	112,013	168,020
Franks/sausage	1601.00.00	570,038	114,008	171,011
Instant noodle	1902.30.00	259,685	51,937	77,906
Butter	0405.10.00	60,181	12,036	18,054
Cheese	0406.	386,746	77,349	116,024
<b>Total Revenue</b>			<b>468,171.6</b>	<b>702,257.4</b>

# Corned Beef Nutrition Facts

Per serving size 100 grams



## Amount Per Serving

Calories from Fat 142

**Calories 248**



	% Daily Values*
<b>Total Fat</b> 16g	22%
Saturated Fat 8.4g	<b>35%</b>
<b>Cholesterol</b> 63mg	21%
<b>Sodium</b> 630mg	27%
<b>Total Carbohydrate</b> 0g	0%
Dietary Fiber 0g	0%
Sugars 0g	

## Protein 14g



Vitamin A -                      ■ Vitamin C -

Calcium -                        ■ Iron 6%

\* Percent Daily Values are based on a 2000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

# Spam Nutrition Facts

Per serving size 100g



## Amount Per Serving

Calories from Fat 245

**Calories 315**



	% Daily Values*
<b>Total Fat</b> 28g	38%
Saturated Fat 10.5g	<b>53%</b>
Trans Fat 0g	
<b>Cholesterol</b> 123mg	41%
<b>Sodium</b> 1383mg	<b>60%</b>
<b>Total Carbohydrate</b> 3.5g	0%
Dietary Fiber 0g	0%
Sugars 0g	

**Protein** 12.25g



Vitamin A 0%      ■ Vitamin C 0%

Calcium 0%      ■ Iron 2%

\* Percent Daily Values are based on a 2000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.



# Hot Dog Franks Nutrition Facts

Serving Size 100 g

## Amount Per Serving

Calories from Fat 214

**Calories** 286

	% Daily Values*
<b>Total Fat</b> 23.81g	38%
Saturated Fat 8.4g	35%
<b>Cholesterol</b> 85.3mg	28.6%
<b>Sodium</b> 904mg	<b>39%</b>
<b>Total Carbohydrate</b> 4g	2.4%
Dietary Fiber 0g	0%
Sugars 4.8g	

## Protein 7.1g

Vitamin A 0%      ■ Vitamin C 0%

Calcium 9%      ■ Iron 5%

\* Percent Daily Values are based on a 2000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Nutrition Values are based on USDA Nutrient Database SR18

# Instant Noodles Nutrition Facts

Serving Size 100g



## Amount Per Serving

Calories from Fat 163

**Calories 450**



**% Daily Values\***

<b>Total Fat</b> 17g	23%
Saturated Fat 7.5g	31%
Trans Fat 0g	
<b>Cholesterol</b> 0mg	0%
<b>Sodium</b> 1188mg	<b>52%</b>
<b>Total Carbohydrate</b> 59g	20%
Dietary Fiber 2.5g	10%
Sugars 3g	

## Protein 7g



Vitamin A 0%      ■ Vitamin C 0%

Calcium 10%      ■ Iron 2%

\* Percent Daily Values are based on a 2000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

# Butter Nutrition Facts

Per serving size 100 g



## Amount Per Serving

Calories from Fat

**Calories 717**



	% Daily Values*
<b>Total Fat</b> 81.11g	125%
Saturated Fat 51.368g	257%
Trans Fat 0g	
<b>Cholesterol</b> 215mg	72%
<b>Sodium</b> 643mg	28%
<b>Total Carbohydrate</b> 0.1g	0%
Dietary Fiber 0g	0%
Sugars 0.1g	0%

## Protein 1g



Vitamin A 50%      ■ Vitamin C 0%

Calcium 2%      ■ Iron 0%

\* Percent Daily Values are based on a 2000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Nutrition Values are based on USDA Nutrient Database SR18

# Cheddar Cheese Nutrition Facts

Per serving size 100 g



## Amount Per Serving

Calories from Fat 291

**Calories 403**



	% Daily Values*
<b>Total Fat</b> 33g	<b>51%</b>
Saturated Fat 21g	<b>87.5%</b>
Trans Fat 0g	
<b>Cholesterol</b> 105mg	35%
<b>Sodium</b> 621mg	26%
<b>Total Carbohydrate</b> 0g	0%
Dietary Fiber 0g	0%
Sugars 1g	0%

## Protein 25g



Vitamin A 20%      ■ Vitamin C 0%

Calcium 72%      ■ Iron 4%

\* Percent Daily Values are based on a 2000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Nutrition Values are based on USDA Nutrient Database SR18

## Annex 4: List of people consulted

### Participants in consultation meetings held during 12-22 May, 2014

Name	Designation
Alex Suzuki	Executive Chef, Palau Pacific Resort
Amanda Bennet	Nutritionist, Ministry of Health
Anne Kitalong	Consultant, The Environment INC
Asia Sowad	Admin Officer, Ministry of Education Food Services
Bob Bishop	Farmer/Consultant/Palau-Taiwan Farmers Association
Carla Ngiralemesang	Asst. Nutritionist, Ministry of Health
Carol Emaurois	Ngramel-Airai Women's Group
Dave Orrukem	Special Advisor, Bureau of Tourism
Dorchas Ngiruchelbad	Division of Environmental Health
Dorothy Ueda	Admin Officer , Bureau of Tourism
Evelyn Yano	Manager Yano's Market
Felix Sengebau	Palau Community College
Francesca Sugino	Pesticide Officer, Environmental Quality Protection Board
Fred Sengebau	Director, Bureau of Agriculture
Gow-Shyang Suen	Leader, Taiwan Technical Mission in the Republic of Palau
Itaru Kishigawa	President, OISCA
J Maireng Sengebau	Consultant, Belau Health Solutions & Technologies
Jennifer Koskelin Gibbons	Executive Director, Palau Chamber of Commerce
Joline Spesungel	Customs Office, Ministry of Finance
Judy Otto	Coordinator, Belau Cares Inc.
Kashgar Rengulbai	Extension Officer
Kyonori Tellames	Senior Planning Analyst, Ministry of Finance
Leonard Basilius	Palau Community Action Agency
Lisa Abraham	Manager, Small Business Development Centre
Madelsar Ngiraingas	Palau Community College
Maria Rehuher	Palau Taiwan Farmers Association
Mark A. Vereen	Palau Chamber of Commerce
Nanette Malsor	Director, Bureau of Oceanic Fisheries
Sandra D. Mincer	President, National Development Bank of Palau
Sebangiol Sakuma	Director, Belau Tourism Association
Tiare Holm	Climate Change Consultant
Trebkul Tellei	Acting Director, Bureau of Agriculture
Vicky Maui	Instructor, Palau Community College
Xingpun Wu	Commercial Farmer

### Participants at the focus group meeting held on 22 May, 2014

Name	Designation
Amanda Bennett	Nutritionist, Ministry of Health-NCD
Ann E Kitalong	Manager, The Environment Inc.
Judy Otto	Coordinator, Ulekerreuil a Klengar, UAK
Karla T. West	Operations Manager, National Development Bank of Palau
Leonard Basilius	Preschool farming Coordinator, Palau Community Action Agency
Lisa Abraham	Manager, Small Business Development Center
Madelsar Ngiraingas	PACC Coordinater, Palau Community College
Sandra D. Mincer	President, National Development Bank of Palau

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