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Samoa Morinda citrifolia (Nonu) Case Study

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Agriculture for Growth: learning from experience in the Pacific

Samoa *Morinda citrifolia* (Nonu) Case Study

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ACRONYMS

ADB	**Asian Development Bank**
ASEAN	**Association of Southeast Asian Nations**
ASTI	**Agricultural Science and Technology Innovation**
AusAID	**Australian Agency for International Development**
CBS	**Central Bank of Samoa**
CDE	**ACP-EU Centre for Development of Enterprise**
EPA	**Economic Partnership Agreement**
EU	**European Union**
FAO	**Food and Agriculture Organisation of the United Nations**
FY	**Financial Year**
GDP	**Gross Domestic Product**
HACCP	**Hazard Critical Control Point**
ISO	**International Standards Organisation**
LDC	**Least Developed Country**
MAF	**Ministry of Agriculture and Fisheries**
MCIL	**Ministry of Commerce, Industry and Labour**
MFAT	**Ministry of Foreign Affairs and Trade**
NASAA	**National Association for Sustainable Agriculture, Australia Limited**
NAS Inc.	**Nonu Association of Samoa Incorporated.**
NES	**National Export Strategy**
NVS	**National Vegetable Strategy**
PACER	**Pacific Agreement on Closer Economic Relations**
PICTA	**Pacific Island Country Trade Agreement**
PINA	**Pacific Islands Noni Association**
REER	**Real Effective Exchange Rate**
SAME	**Samoa Association of Manufacturers and Exporters**
SAT	**Samoan Tala**
SBEC	**Small Business Enterprise Centre**
SDS	**Strategy for the Development of Samoa**
SEA	**Samoa Export Authority**
SPS	**Sanitary and Phytosanitary**
SROS	**Scientific Research Organisation of Samoa**
TNI	**Tahitian Noni International**
US	**United States of America**
WIBD	**Women in Business Development**
WTO	**World trade Organisation**

The Exchange rate used in this report: 1 US$ = 2.6 SAT$

EXECUTIVE SUMMARY

Approximately 75% of the Samoan population lives in rural communities with over 130,000 people relying in some measure on the productivity of the agriculture sector. But the sector has performed relatively poorly and has been a constraint on growth for several years. Today larger-scale commercial agriculture is a small component of total agriculture and subsistence agriculture accounts for nearly half of agricultural output. Samoa's natural resource endowment and remote location mean that it has potential advantages for organic agriculture.

The Strategy for the Development of Samoa (SDS) 2008-2012 identifies accelerating economic growth through private sector development as a vital goal to improve living standards. Agriculture and Fisheries are described as key sectors for achieving private sector led economic growth and employment creation. The SDS recognises that if agriculture is to grow, there will need to be an increased emphasis on commercial production.

Morinda citrifolia (nonu) grows extensively throughout the Pacific and is widely used as a traditional herbal medicine in almost all Pacific Island societies. In recent years nonu has become increasingly popular as a health food drink in developed countries around the world. Commercial production of *Morinda citrifolia* products in the Pacific began in the mid-1990s with a Utah, US-based Company, sourcing fruit juice from Tahiti. Attracted by the high prices being paid for *Morinda* products (particularly juice), several countries in the Pacific commenced their own commercial production and export, but overall Samoa has achieved the greatest success in terms of sustained export value and volume.

Over the last decade nonu has contributed significantly to rural incomes and the economy and has been Samoa's major agricultural export since 2004.The total value generated by the nonu value chain to the Samoan economy is estimated to be around SAT$ 33.5 million (US$ 13.4 million) and of this, the farmer's share of total value has been around 24% whilst the processors share has been around 76%. In 2005, the peak year of production, approximately 3,800 tonnes of fruit was processed to export around 1.5 million litres of juice and 167 thousand kg of dried fruit products.

In the early years overseas demand for nonu products exceeded Samoa's capacity to produce since much of the raw materials were being supplied mainly by an existing stock of trees growing wild around the country. Production was stimulated through a national nonu day event and promotion of the crop led by the product processing industry. However, during the slump in export demand in 2008 much fruit was going to waste and several growers had cut down trees.

The nonu economic exchange system is market driven with international market demand and prices being the key drivers attracting and sustaining local agri-business participation in the value chain. The nonu market boom in the early 2000's led to Samoa's entry into the global market. However, initial comparative advantage based on widespread availability of nonu which grows prolifically in Samoa is now being eroded through increased competition from new entrants on the international market; therefore significant efforts will be needed to maintain competitiveness in a changing world market.

The nonu industry in Samoa has been developed through private sector drive and facilitation with no specific government support having been accorded. Indeed, government has no particular policy on nonu and remains largely reactive towards industry needs. A culture of entrepreneurism with associated skills in business practice is not widespread in Samoa, particularly in traditional rural village societies. Participation in the industry by several experienced agri-business entrepreneurs has

been vital to the success of the processing and exporting of nonu products. Their willingness to innovate and take risks has been invaluable for the development of the nonu industry.

The industry has been proactive and dynamic in its attempt to upgrade product quality and maintain standards. In 2003 a regional industry association was registered - Pacific Islands Noni Association (PINA) which has promoted quality standards and facilitated technical support to members in this area. In 2009 Samoan processors formed their own industry association. Processors/exporters have recognized that appellations of origin, based on strict standards, quality criteria and production methods are a useful promotional tool for their products.

Public support for nonu industry development (government finance and donor funds) has been limited to date. Some technical assistance has been provided to support product quality improvements (e.g. HACCP training) and some assistance has been provided for attendance at promotional events such as trade fairs, but generally promotion of Samoan products has lacked sufficient resources to deliver desired impact. Processors have also indicated constraints in financing capital improvements in plant (for pasteurising juice) and for better drying technology. Nonu's prolific growth has made it a relatively easy crop for Samoan farmers to tend and sustain a yield from. This has been a fortunate factor as little research and extension support for development of the crop has been provided by government services.

The public sector does have an important role to fulfill to partner and assist the private sector in the development of the nonu industry. A first priority for government is to articulate a clear policy for nonu identifying possible areas of government support and partnership. Areas for potential government support are in productivity research and extension, product development and quality assurance, market intelligence, product promotion and trade facilitation.

Smallholder village agriculture relies predominantly on family labour therefore the availability and opportunity cost of labour are factors critical to the development and competitiveness of the nonu industry. Various factors including, migration, remittances, seasonal overseas labour programmes, urbanisation, growth of rural tourism activities and social obligations (including subsistence food production) impinge on the opportunity cost of labour for commercial agriculture. What appears clear is that high returns to effort are critical to encourage participation of semi-subsistence farmers in more commercial agriculture. Unfortunately, there is no data on either land or labour productivity for nonu in Samoa and hence no information on which to establish current returns to effort.

There appears to be considerable opportunity to increase both land and labour productivity as virtually nothing has been done in this area to date. A particular priority is to establish a profile and gross margin for nonu production under different management systems in order to better inform farmers on ways to lower output costs whilst also improving returns to effort. The Scientific Research Organisation of Samoa (SROS) could be a strong partner to the industry assisting with product development and quality assurance.

Unpredictability of the market has resulted in bottlenecks in the supply chain. Coordination of farm supply with processors demand is therefore another area which could be improved. Whilst the opportunity to dry fruit and hence use more of the ripe product is available to farmers, capacity to dry the fruit is limited and this often results in poor quality product which is rejected by the processors. Simple solar drying technology could be explored for use at village level to improve the efficiency and effectiveness of fruit drying and thus reduce rejections and improve returns to effort. Improved drying technology at processor level is another potential area for investment.

Increased through-put and consistency of operation for processing plants would improve efficiency and reduce unit cost; however this is largely dependent on securing predictable export market demand. With increasing price competition it will be essential to maintain high quality products and differentiate and brand these accordingly. Nonu products generally enter a "luxury" health-food market with demanding requirements on quality and other environmental issues of production. These factors may be more important for consumer choice than simply price. There seems to be opportunity in Samoa to expand certified organic production of nonu and possibly link this with "fair trade" marketing.

Improved market intelligence, linkages and promotion are key factors for market development. The relatively small nonu industry in Samoa does not have the resources and capacity for undertaking market intelligence studies to identify market potential and specific market opportunities, or for rigorous promotion of its products. Basic information on end markets has the character of a common good that is shared among chain operators and therefore there is room for government/ external development agencies to conduct, facilitate or commission market research as an essential contribution to chain upgrading.

Modern commerce (including global nonu trade) increasingly involves electronic exchange—from electronic signatures on contracts to purchasing over the Internet. The ability to perform commercial transactions electronically greatly reduces the costs of contracting and is especially important for countries that are far from the main markets with which they deal. However, to fully utilize electronic exchange, Samoa will first need to develop its legislation in this area.

Like most Pacific island countries, Samoa has a very small domestic market and needs to participate in international trade to generate growth based on agricultural productivity. Therefore, they must establish international market niches that will allow them to charge prices that will cover their high international trade costs. Nonu has offered such an opportunity and Samoa has seized it. The experience of nonu in Samoa demonstrates how beneficial high-value niche commodities can be for semi-subsistence village farmers. But opportunity to scale up nonu production in Samoa is ultimately dependent on the international market demand and price. A more predictable (and possibly increased) demand might be established by stronger coordination in the supply chain through greater vertical integration. Exploring possibilities to establish supply contracts with global distributors is one avenue that could be explored.

With increasing global competition and a depressed market environment, Samoa needs to explore every avenue to increase its competitiveness and market share in the international nonu market. Improving the organization and efficiency of the supply chain will be necessary. The private sector has been dynamic in developing the nonu industry and their sustained efforts and innovation will continue to be the critical factor for future success. In addition, a number of interventions are required by the government to help reverse the downward trend and stimulate the industry so as to regain export competitiveness. To that end, appropriate actions are needed to create a strong national nonu policy and a robust institutional framework, enhance the producers' technical expertise so as to improve productivity and quality and to support market development through assistance for market research and promotion.

The Samoan government has recognized the importance of the private sector in agricultural development and the need to work effectively with them. An important challenge facing government is to work more proactively with the private sector in developing and implementing policies and strategies to support agricultural development generally and the nonu sector specifically.

Initially high international prices for nonu juice, a relatively easily available supply of fruit from existing wild-growing plants and a core of experienced processors/exporters seeking new opportunities combined to stimulate the growth of the nonu industry in Samoa. Nonu has fitted well into the traditional system and is easily incorporated into the daily routines of semi-subsistence farm lifestyles offering a needed opportunity for spot cash earning. Nonu under current management systems is not labour intensive and is a flexible addition to the farming system which allows farmers to enter into commercial trade when the market price is attractive and easily exit when it is not. Growing wild or integrated into a traditional mixed farming system nonu has offered cash earning opportunities without negatively impacting on staple food crop production; nonu therefore has had positive benefits for enhancing food security.

1. INTRODUCTION

1.1 CASE STUDY BACKGROUND

This study is one of group of studies undertaken in five Pacific island countries to examine critical factors which enable smallholder farmers to participate in commercial agriculture. The most important criteria for selecting nonu[1] (*Morinda citrifolia*) as the study subject was that significant number s of small farmers and enterprises are involved in the value chain and also that *Morinda* is a crop of interest to several other Pacific island countries. Nonu has contributed significantly over the last decade to rural incomes and the Samoan economy and has been the major agricultural export since 2004.

Economic growth only contributes to poverty reduction if an increasing proportion of the poor actively participate in economic processes. In Samoa about 40% of the population lives in the greater Apia urban area and 70% of economic output is generated here. Income distribution disparities are expected to worsen as a result of the good economic growth unless there are targeted measures to channel support to the pockets of hardship in the rural communities[2]. The nonu product market and value chain has provided accessible income earning opportunities to families in the remote rural areas including the southern coast of Upolu and northwest coast of Savaii thus helping to share the benefits of economic growth throughout the country.

Whilst the importance of the agriculture sector to the economy and rural livelihoods is recognized, the sector is yet to achieve its growth potential despite government reforms to improve the enabling environment for business development. Key questions therefore remain as to what are the reasons for this underperformance of the agriculture sector.

1.2 ECONOMY AND THE AGRICULTURE SECTOR

Samoa has a small open economy (GDP under US$ 500 million) that has performed relatively well over the last decade compared to most other Pacific island countries. Annual growth rate accelerated from under 2.0% in the 1970s and 1980s to more than 4.2% in 1994–2007, but with considerable fluctuation in year to year growth ranging from 1.5% to a high of 8%. With an annual net population growth rate of 0.9% in the 1990s and 0.3% in 2001–2006, the economic growth has translated into significant per capita income growth (averaging about 1.5% per annum). With rising living standards, several social indicators, like life expectancy, infant mortality, and poverty, are fast improving.

Services (commerce and tourism) and construction (fueled by relatively large injections of donor grant money and soft loans) have been the main drivers of growth. Workers' remittances have also been increasingly important (Private remittances averaged 20.0% of GDP annually in 1990–2003 and reached SAT$ 347.4 million in 2007). In contrast, the Agriculture sector (including fisheries) and manufacturing have stagnated or declined in recent years (Table 1). The structure of the economy in 2007 was; services 63%; Industry 26% and Agriculture 11%[3].

[1] *Morinda citrifolia* is locally called nonu in Samoa and noni in some other Pacific countries.
[2] KVA Consult Ltd. (2007). Samoa Economic Update 2007 Pacific Economic Bulletin Volume 22 Number 3
[3] Asian Development Bank (2007) *Key Indicators: Inequality in Asia.* Manila

Samoa's success has been attributed to Political and social stability, sound macroeconomic management and progressive structural reforms implemented by the government. Samoa has liberalised its trade regime by reducing and simplifying tariff rates into four clusters (20%, 8%, 5% and o%) and has been active in implementing Pacific Island Country Trade Agreement (PICTA), negotiating for an Economic Partnership Agreement (EPA) with the European Union and to accede

Table 1: Sector Shares of GDP, 1998 and 2007 (SAT$ million at constant 2002 prices)

Sector	1998	2007
Agriculture	78.6	71.8
Fishing	68.7	55.8
Food & beverages manufacturing	23.2	27.8
Other manufacturing	75.0	106.4
Construction	44.9	98.9
Electricity and water	27.5	47.3
Commerce	121.6	212.1
Hotels & restaurants	12.6	34.3
Transport & communication	85.9	136.4
Public administration	56.8	84.2
Finance and business services	59.0	101.7
Less; enterprise share of FISIM	(7.7)	(12.7)
Ownership of dwellings	30.7	36.7
Personal and other services	47.4	53.1
Non-monetary as % total GDP	18	13*
Value added (SAT$ million) at 2002 market prices	**724.2**	**1,053.9**

**2006 estimate Source: Samoa Bureau of Statistics*

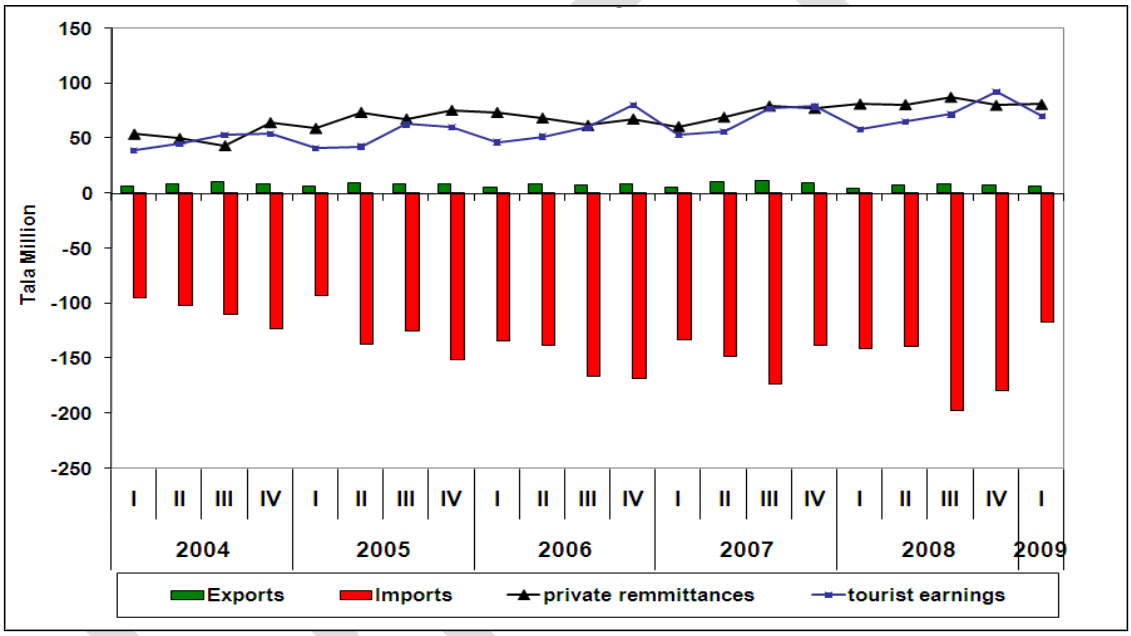
to the World Trade Organisation (WTO). The Government has also focused considerable attention to upgrading transport infrastructure, roads, ports and the international airport. Through a government-private joint venture international air services have been improved through lower prices and increased destination connections. The telecommunications industry has also been opened for competition in the mobile phone sector, significantly reducing costs and increasing population coverage. Samoa has a relatively well run sea port under a government corporation which acts as "landlord" to private sector wharf-side service providers[4]. The port has good ship connections and turnaround time is relatively fast. The country is well-served by container ships operating international routes and a merchandise trade imbalance means that there is ample container space for export cargo. But shipping costs are high due to the small and imbalanced cargo flows associated with the high merchandise trade deficit and because of long distances between ports of call.[5] High transport costs are equivalent to a tax on exports and imports, and are a key factor impacting on Samoa's competitiveness in the global market.

[4] Samoa Port Authority provides pilotage, dredging, and security (to standards set by the International Maritime Organization) and leases port infrastructure to private operators, who provide superstructure (e.g., forklifts) and whose service provision is regulated by the Authority. Private companies currently provide stevedoring, container handling, and major maintenance.

[5] Australian Agency for International Development (AusAID), *Pacific Regional Transport Study* (Canberra: AusAID, 2004).

Despite Samoa's "economic success" it still runs a huge merchandise trade deficit with imports being some 20 times higher than exports. As a small open economy, where almost everything is imported, foreign exchange earnings are vital. The current account is largely balanced by inflow of private and official transfers and tourism receipts (Figure 1). The main merchandised exports are fish, beer and a few agricultural commodities (principally nonu and coconut products). Export performance over recent years has been disappointing, despite some year-on-year variation exports have generally declined and agricultural exports (excluding fish) have dwindled with nonu emerging as the main export product since 2004. Without remittances and external aid flows, Samoa would face severe balance-of-payments difficulties. Improved export performance is therefore critical to addressing balance of payments issues. Tourism has shown good promise as a growth industry with potential for improving foreign exchange earnings; however, the combined impacts in 2009 of a tsunami[6] and fire damage to a major Apia hotel are likely to depress tourism earnings in the short-term. Invigorating commercial agriculture therefore remains vital for improved export earnings, continued growth and sustainable rural livelihoods.

Figure 1: Samoa Balance of Payments



Source: Central Bank of Samoa Bulletin June 2009

The continued opening up of the economy in recent years means that exchange rate policy is increasingly important to the nation's economic prospects. The main objective of the Central Bank's policy is to ensure that export oriented industries remain competitive in overseas markets whilst at the same time minimising imported inflation. The exchange rate for the Tala is managed by pegging it to a trade-weighted basket of currencies of major trading partners, with the New Zealand dollar and the US dollar the most significant. The nominal exchange rate has been relatively stable over the

[6] A magnitude 8.3 earthquake occurred at 0648 hours on Tuesday 29 September 2009 190 km south of Apia. The earthquake triggered tsunami waves which impacted Samoa, American Samoa and the small northern island of Niauatoputapu in Tonga. The tsunami waves, some of which are said to have been as high as six metres, caused fatalities, casualties and serious damage to the affected Pacific Island countries.

past decade, although the real effective exchange rate (REER) has appreciated since 2001 (Table: 2). Real appreciation of the Tala adversely affects international competitiveness of export oriented industries.

Table 2: Exchange Rates (end of FY) 2001-2008

	2001	2002	2003	2004	2005	2006	2007	2008
US Dollar	0.2842	0.3004	0.3367	0.3513	0.3369	0.3331	0.3876	0.3985
NZ Dollar	0.6975	0.6239	0.5716	0.5544	0.5294	0.5814	0.5029	0.5242
Australian Dollar	0.5557	0.5384	0.5011	05059	0.4837	0.4780	0.4585	0.4185
Japanese Yen	35.30	36.22	40.15	37.59	39.63	40.34	47.51	42.08
European Euro	0.3342	0.3065	0.2938	0.2887	0.3034	0.2772	0.2868	0.2543
(Base year 1998)								
Nominal Effective Exchange Rate (NEER)	99.49	96.67	95.81	96.93	97.40	97.51	98.25	98.41
Real Effective Exchange Rate (REER)	99.12	105.44	108.28	113.54	120.06	118.29	121.25	126.75

Source: Central Bank of Samoa

There is no doubt the global financial crisis has impacted on the Samoan economy. Coming off a period of fairly strong expansion in 2007, the economy has shown signs of contraction for the first time in over a 10-year period. The Central Bank of Samoa[7] reported that for the calendar year 2008, the Samoan economy registered a real decline of 3.4 percent. Private remittances and tourist receipts are both expected to decline as a result of the financial crisis on the travel industry and loss in incomes from increasing unemployment in those countries such as Australia, New Zealand and the US where much of the remittances and travel receipts originate. Merchandise exports dropped by 28.7% in nominal terms in 2008 and remained a small fraction of merchandise imports, which were boosted by higher prices for imported petroleum products. The merchandise trade deficit widened from 40.5% of GDP in 2007 to about 45% in 2008. Inflation remains a key concern; 2008 year-average inflation at 11.5% was more than double the 2007 outcome[8] . The Governor of the CBS[9] has recognized the significant challenge of maintaining macroeconomic stability in an environment of high inflation, declining export revenues, forecast lower remittance flows and a volatile global tourism industry[10]. However, the Government[11] has noted that the direct impacts of the crisis have been cushioned by informal social protection mechanisms and the strength of the subsistence economy.

Approximately 75% of the population lives in rural communities, and about 80% of families engage in some form of agriculture. The 2005 agricultural survey identified 17,829 agriculturally active

[7] Central Bank of Samoa Bulletin, June 2009 p.8
[8] Asian Development Bank Outlook 2009
[9] Governor Leasi Papali'I Scanlan's address at the Pacific Wave Conference on "Weathering the Economic Storm" in Auckland 3-4 June, 2009 printed in CBS Bulletin, June 2009.
[10] Significant fire damage to major Apia hotel and a devastating tsunami destroying tourist resorts and accommodation in September 2009 will severely impact the tourism industry.
[11] Hon. Niko Lee Hang, Minister of Finance, Government of Samoa 2009/2010 Budget Address, 29 May 2009.

households in Samoa, as those who are involved in agriculture of some sort. This represents 77% of the total households surveyed thus implying that over 130,000 people rely in some measure on the productivity of the agriculture sector. But agriculture has performed relatively poorly and has been a constraint on growth for several years.

Today larger-scale commercial agriculture is a small component of total agriculture, with coconut plantations (mostly government owned) surviving from the German colonial period accounting for most of the (minimal) output. Subsistence agriculture accounts for nearly half of agricultural output. Taro has traditionally been the country's most important agricultural product, but production continues to suffer the after effects of the devastating taro leaf blight outbreak in 1993. Following the introduction leaf blight resistant varieties and farmer-led selection programmes there has been a partial recovery, but Samoa has not yet reestablished significant taro exports[12]. The negative effect on tree crops of a series of cyclones is also evident. Despite the decline in agricultural production and exports, Samoa's natural resource endowment and remote location mean that it has potential advantages for organic agriculture. Organic farming has gathered momentum since its beginnings in 1998, in 2006 there were 213 farms certified organic with an estimated area for organic cultivation of 7,243 ha[13], but current export capacity is relatively small and confined mostly to coconut oil and nonu. Three nonu processors have organic certification.

1.3 NATIONAL AND SECTOR POLICY FRAMEWORK

The Strategy for the Development of Samoa (SDS) 2008-2012 identifies accelerating economic growth through private sector development as a vital goal to improve living standards. Agriculture and Fisheries are described as key sectors for achieving private sector led economic growth and employment creation. The SDS recognises that if agriculture is to grow, there will need to be an increased emphasis on commercial production.

Facilitating trade and improving exports remains a key priority for Samoa and the government has pursued an open trade policy since the mid-1980s and has reduced tariffs substantially. But while economic partnership agreement negotiations continue with the EU and PACER-plus negotiations have commenced with Australia and New Zealand, Japan and the Association of Southeast Asian Nations (ASEAN) reached a free trade agreement in May 2007, under which Japan will largely remove tariffs on industrial products and reduce or eliminate tariffs on tropical fruit imported from ASEAN countries. As a result, Pacific Island Forum countries will face relatively high tariffs on their exports to the Japanese market. Through its status as a UN listed Least Developed Country (LDC), Samoa has enjoyed preferential access (zero tariffs) to important export markets, but Samoa is scheduled to lose this status in December 2010 and therefore the outcome of current trade negotiations will become increasingly important.

A National Export Strategy (NES) 2008-2012 espouses a vision for the "Export sector to be a major contributor to sustainable economic growth by 2012" and calls for establishment of a national body called the Samoa National Export Authority (SEA) to manage and coordinate the activities of the whole export sector. The NES identifies eleven objectives to achieve the vision and five sectors (including agriculture) that are key to the improved export performance of the country. Important strategies include legislation and enforcement of food safety standards, developing a Samoan brand, develop organic products and certification, establish fair trade products registration and regulation, train on HACCP and ISO certification of business processes and carry out value chain analysis of potential products. The related strategy of improving timeliness of market information (including

[12] Taro exports valued at SAT$ 600,000 in 2007/08 – Central Bank of Samoa Bulletin December 2008.
[13] Winnie Fay Bell (May,2009), Organic Agriculture and Fair Trade in Pacific Island Countries, Natural Resources and Environment Department, FAO

quarantine requirements) to exporting businesses and farmers is presented in both SDS 2005-2007 and SDS 2008−2012. But to date there has been little discernible improvement in the fulfillment of this function, which is split between the Ministry of Agriculture and Fisheries, the Ministries of Commerce, Industry and Labour, and Foreign Affairs and Trade. Potential investors can find suggestions on investment opportunities in tourism, fisheries, and manufacturing at the Ministry of Commerce, Industry and Labour's website (www.mcil.gov.ws/), but no detailed marketing or feasibility studies; while agricultural research and extension services, in particular, have been assessed as lacking a private sector market orientation.[14]

Despite the recognized importance of the agriculture sector, there is currently no agriculture sector plan to provide a coherent policy framework for promoting agricultural development. Inevitably, government interventions in agriculture have tended to be *ad hoc.*

1.4 INTRODUCTION TO THE SELECTED SUB-SECTOR FOR THE STUDY

Morinda citrifolia or the Indian Mulberry is a member of the *Rubiaceae* (coffee) family. A small evergreen tree growing to 10 metres, *Morinda* has elliptical to obovate, shiny, dark to pale green leaves, similar to citrus species (hence '*citrifolia*'). The tree produces fruits about the size of an egg which resemble miniature pineapples; initially green, as the fruits ripen they turn from yellow to almost white. Fruit should be picked when yellowish-white and firm; when fully ripe the flesh is soft and watery with an unpleasant smell. *M citrifolia* has an ability to survive in harsh environments, it is extremely salt-resistant and can tolerate drought for several months. It is found on a variety of soil types, including sandy atoll shores, rock lava coasts and on limestone and volcanic terrain[15] .

Ripe *Morinda citrifolia* fruit

Source: Nonu Samoa Website

M citrifolia is thought to have originated in the islands of Indonesia in Southeast Asia, but today it has also become naturalized on the open shores of North and South America, from Mexico to Panama, Colombia, Venezuela, and Surinam and on many of the islands of the West Indies, the Bahamas, Bermuda and the Florida Keys[15]. M *citrifolia also* grows extensively throughout the Pacific and is widely used as a traditional herbal medicine in almost all Pacific Island societies[16] .

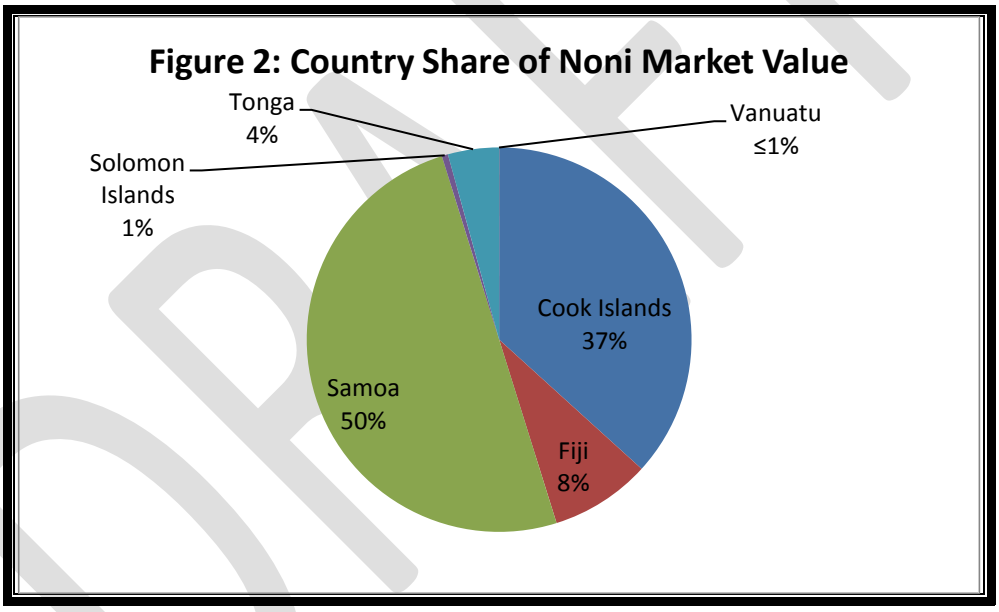
[14] Asian Development Bank. (2008). *Samoa: Private Sector Assessment—Consolidating Reform for Faster Growth.* Manila.

[15] Morton, J.F. (1992). The ocean-going Noni, or Indian Mulberry (*Morinda citrifolia*, Rubiaceae) and some of its "colourful" relatives. Economic Botany 46 (3) pp 241-256.

[16] Valentine, N. (1999). *A preliminary report on non-timber forest products in some Pacific Island Countries*. SPC/UNDP/AusAID/FAO. Pacific Islands Forests & Trees Support Programme Working Paper No. 6.

Phylogenetic research in New Caledonia has demonstrated that *M citrifolia* is nested within a clade of Southwest Pacific endemic species, making it possible that it originated there rather than in Southeast Asia[17]. In recent years *Morinda* has become increasingly popular as a health food drink in developed countries around the world, including the United States, Japan, Australia, New Zealand and several European countries. Markets are also establishing in several Asian countries such as Taiwan, Korea, and China.

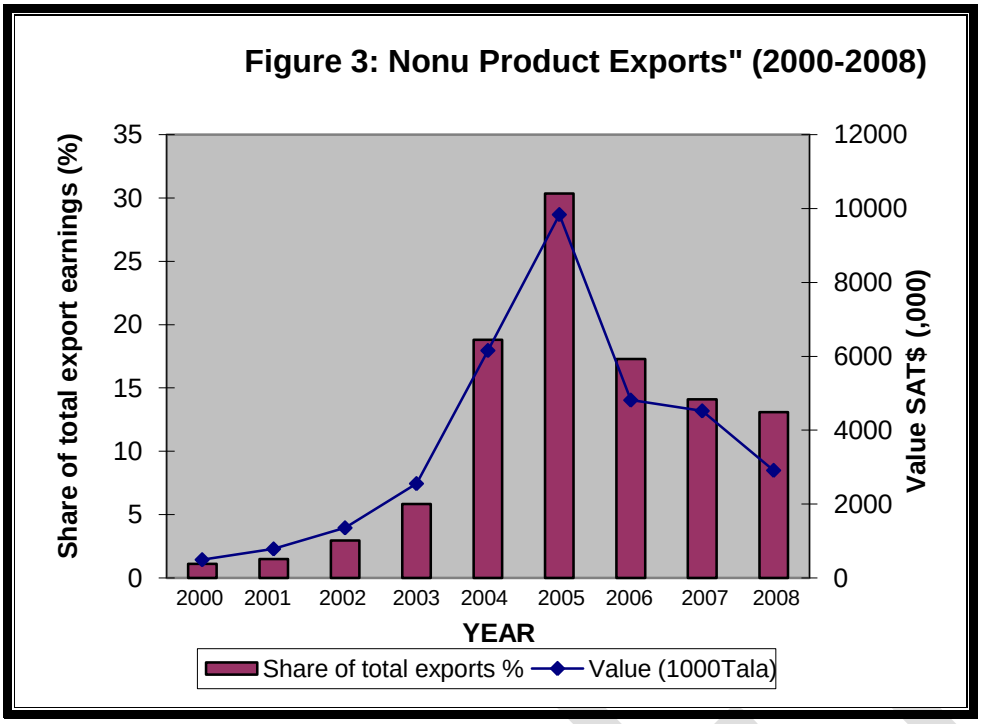
Commercial production of *Morinda citrifolia* products in the Pacific began in the mid-1990s with a Utah, US-based Company, sourcing fruit juice from Tahiti[16]. Tahitian Noni International (TNI) posted an incredible US $33 million in sales during its first year in business in 1997, and became one of the fastest-growing private companies in America with cumulative sales reaching US$2 billion by 2003 and over US$ 4 billion by 2008[18]. Captivated by the meteoric growth of Tahitian Noni and the high prices being paid for *Morinda* products (particularly juice), several countries in the Pacific commenced their own commercial production and export. Amongst these were Cook Islands, Fiji, Tonga, Solomon Islands, Vanuatu and Samoa (Valentine, 1999). Several other countries including PNG, Palau, Marshall Islands, Kiribati, Tuvalu and Nauru have also had some commercial production of noni, but overall Samoa has achieved the greatest success in terms of sustained export value and volume (Figure 2 and Pacific country noni exports in Annex 1).



Source: Calculated from value of nonu exports 2002 -2007 (see data in Annex 1)

Morinda (hereafter referred to by its Samoan name, nonu) first appeared as a small export from Samoa in 2000 with an export value of SAT$495, 000 (about 1 % of total exports). Exports then climbed rapidly to SAT$ 9.8 million (about 30% of total exports) in 2005. Although total export value has subsequently declined to around SAT$ 3 million in 2008, nonu has remained the second largest export product after fish (Figures 3&4). It has also been the most significant agricultural export since 2004 when its value topped that of combined coconut cream and oil exports (Figure 4).

[17] Johansson JT. The genus *Morinda* (Morindae, Rubiodeae, Rubiaceae) in New Caledonia: taxonomy and phylogeny. *Opera Botanica*. 1994;122:1-67.
[18] Tahitian Noni International



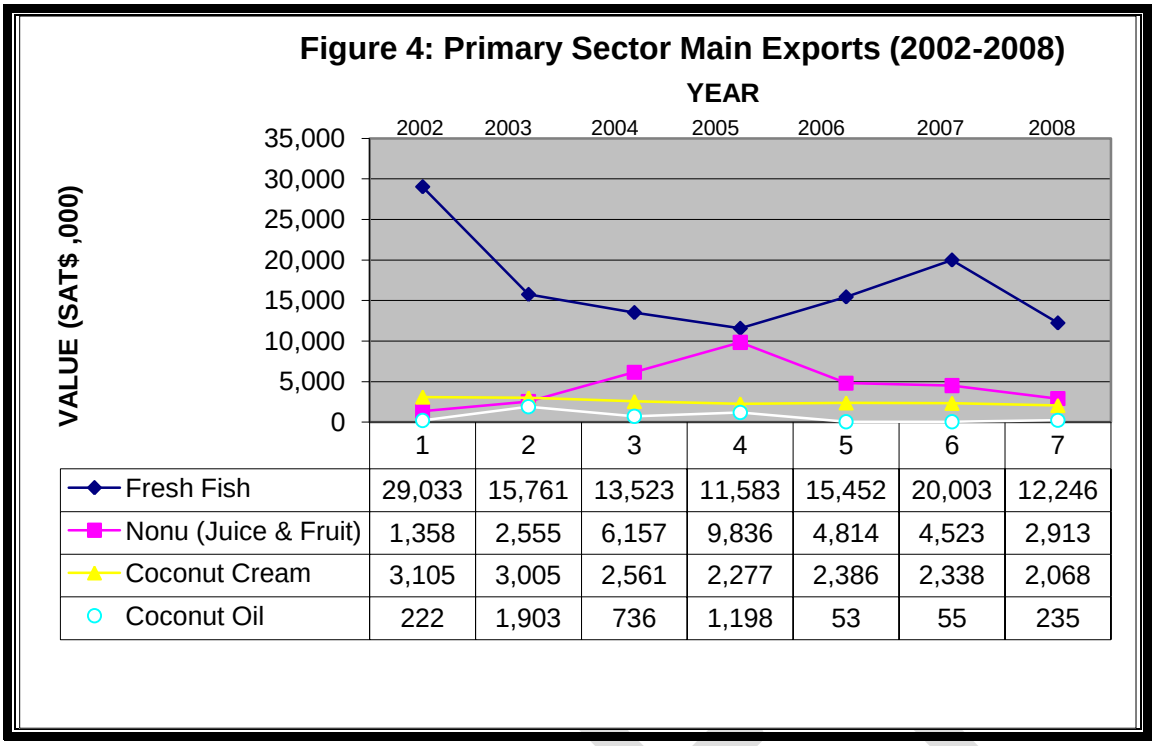
Source: Compiled from Central Bank of Samoa data

Nonu has been exported as both processed juice and dried fruit products (including in chipped and powder forms). The higher value added nonu juice has been the largest export product (Figures 5 & 6) with main markets in the USA, Japan, and Australia. Some smaller shipments have also gone to New Zealand, American Samoa and several other destinations (including Taiwan, Korea and Europen countries[19]).

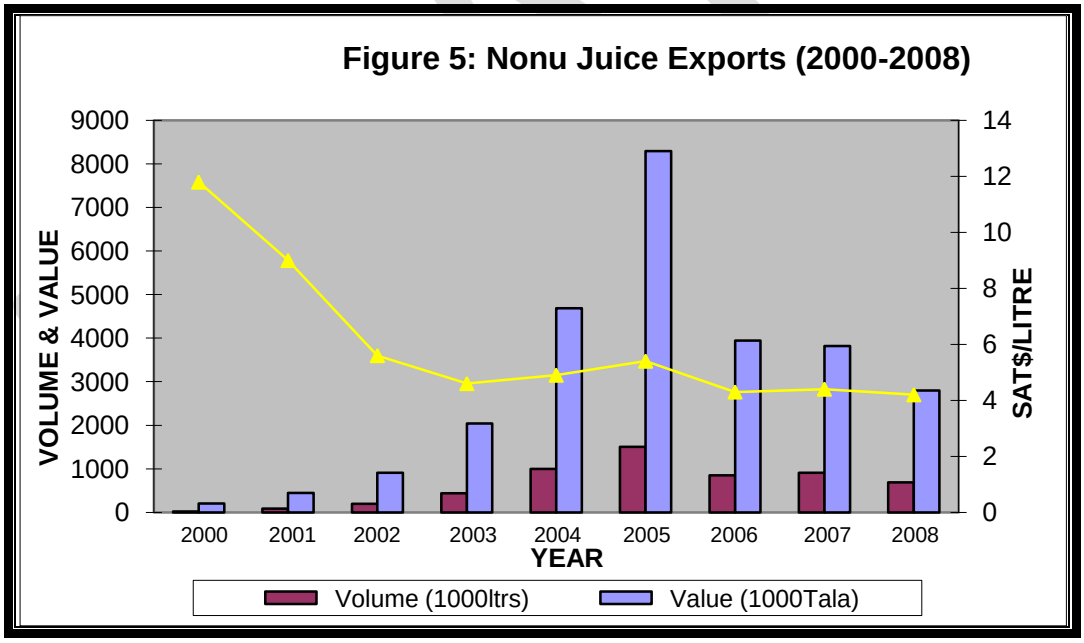
The average unit value of juice exports has dropped from the early high of almost SAT$ 12 per litre in 2000 and has stabalised at around SAT$ 4 per litre from 2006 onwards (Figure 5). During the same period the export value of dried fruit products has increased from around SAT$ 2 per pound (SAT$ 4.4/ kg) to an average price above SAT $ 4 per pound (Figure 6).

Export volumes of both fresh juice and dried fruit which peaked in 2005 have generally declined thereafter, this decline being particularly marked in 2008. However, the first six months of 2009 have seen a rebound in exports of both juice and dried fruit products, with juice export volume and value similar to 2006 levels . Unit price for juice has also held up well (Figures 7 & 8).

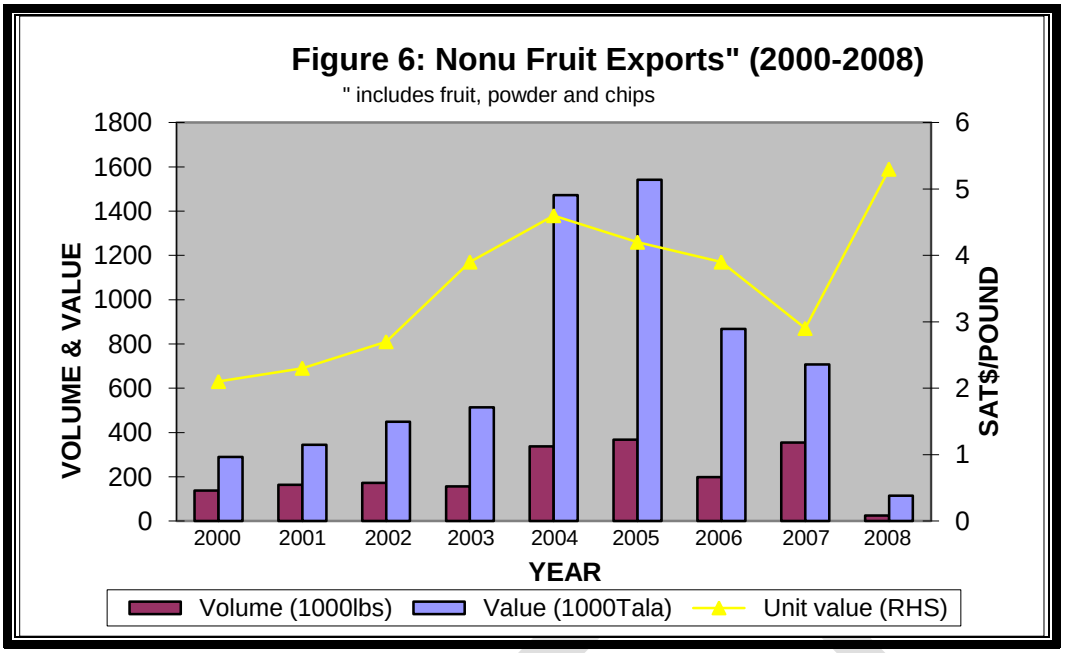
[19] Nonu Database, Samoa Customs Department



Source: Compiled from Central Bank of Samoa data

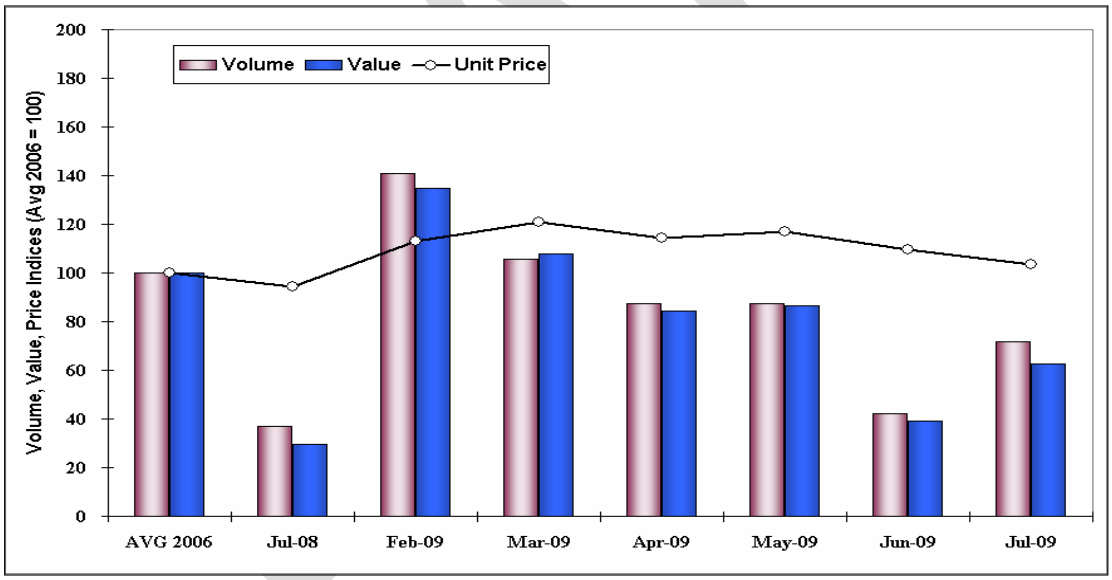


Source: Compiled from Central Bank of Samoa data



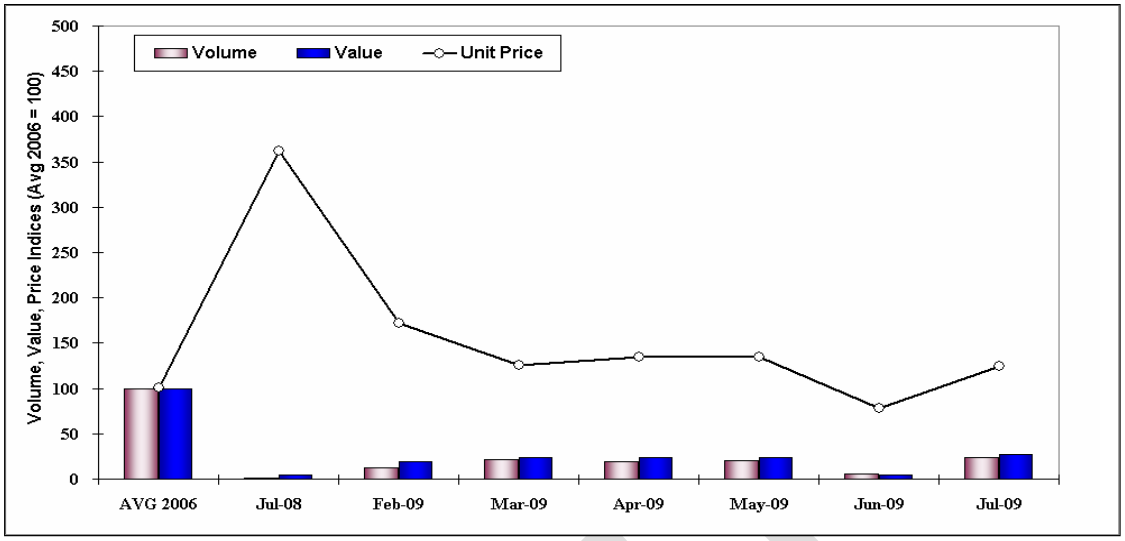
Source: *Compiled from Central Bank of Samoa data*

Figure 7: Nonu Juice Exports



Source: CBS Foreign Trade and Tourism Earnings Report, July 2009.

Figure 8: Nonu Fruit Exports



Source: CBS Foreign Trade and Tourism Earnings Report, July 2009.

Nonu grows wild and profuseley throughout Samoa, flowering and fruiting all year-round. Many nonu producers collect from these wild plants, but a few nonu plantations have also been established, some monocropped and some intercropped with other food crops. Most plantations are small but at least two commercial farmers have planted areas of 5 ha and 16 ha. It has been estimated from interviews with processors that there are around 85 active nonu producers regularly supplying fruit.

Since 2000 there have been several individuals and companies purchasing, processing and exporting nonu products. But by 2009 four companies have sustained activities and emerged as the main players.

In the early years overseas demand for nonu products exceeded Samoa's capacity to produce since much of the raw materials were being supplied mainly by an existing stock of trees growing wild around the country[20]. Production was stimulated through a national nonu day event and promotion of the crop led by the product processing industry. However, during the slump in export demand in 2008 much fruit was going to waste and several growers had cut down trees.

2. STUDY METHODOLOGY

The objective of this study was to collect data and information and analyse this and draw key lessons and recommendations. The study focused on the following questions:

- What market and institutional innovation in supply chains might help smallholder producers?
- What are the dynamics associated with this pathway of commercialisation and what critical conditions are necessary to allow smallholder farmers to take advantage of new opportunities?
- How has this "successful" enterprise dealt with structural and institutional challenges?
- What measures encourage value chain participation by smallholder farmers?
- What is the potential for scaling up and multiplying this "successful" pathway within the country and across the region?

[20] Samoa Monetary Policy Statement 2004/2005

These questions were addressed through desk research assessing secondary data, with extensive review of government documents and statistical data and internet research[21]. Additionally empirical research was undertaken through interviews (using a semi-structured format) with key informants including nonu processors/exporters and relevant government and NGO personnel. Interviews were also carried out with nonu producers (farmers and collectors) on both main islands Upolu and Savaii. Information collected in recent surveys in 2007/2008 from nonu producers by the Ministry of Agriculture[22] was also reviewed .Field visits/observations were also carried out at farm sites and at processing factories. All primary interviews were conducted during July/August 2009.

3. KEY FINDINGS & DISCUSSION

3.1 VALUE CHAIN OF THE TARGETED PRODUCT

An overview of the nonu juice value chain is shown in Figure 9. The figure only considers share of consumer price for juice on the Samoa domestic market and the US export market. Prices used in the calculations are averages obtained from a survey of prices.

Nonu fruit is produced by village farmers in small cultivated plots, collected from wild plants growing on/around village farm land and "backyards", and on dedicated farms owned by nonu processors. Fruit is purchased directly by processors at the farm gate for spot prices. Processors also utilise village agents to notify farmers/collectors of their needs and to help organise purchases of fruit. Radio broadcasts are sometimes used to alert farmers of processors buying needs. Some farmers/collectors deliver fruit directly to processing factories and receive spot price cash payments. One processor has set-up operation in Savaii and provides some supply of juice/ pulp to a larger processing operation in Upolu.

Farm dried product is marketed in a similar way as fresh fruit. The majority of farm dried fruit is produced in Savaii where an extended shelf-life and reduced bulk is useful for transport back to Upolu where the main processing factories are located. Farm-level solar drying reduces moisture content to about 20% and is a rather crude process.

Green fruit are roughly chopped and spread on mats or roofing iron laid out in the sun. Climatic conditions of high humidity and frequent showers results in an inefficient process and frequent problems with mould, which results in a significant level of rejects by buyers. The product is further dried by processors to about 7- 8% moisture before being milled into products of different coarseness.

All the current processors export juice and most also export other dried products such as chips and powder; at least one operator exports dried nonu leaves. Some of the products being marketed are shown in Table 3. The domestic market demand is currently very small and the bulk of nonu products are exported.

[21] A study carried out in 2006 on the Application of the Agricultural Science and Technology Innovation (ASTI) methodology to analyse noni (*Morinda citrifolia*) innovation system in Samoa and Tuvalu, Viliamu Iese (University South Pacific) and Mary Taylor (Secretariat of the Pacific Community) provided useful information.
[22] Crops Advisory Section Report (unpublished).

Figure 9: NONU JUICE VALUE CHAIN

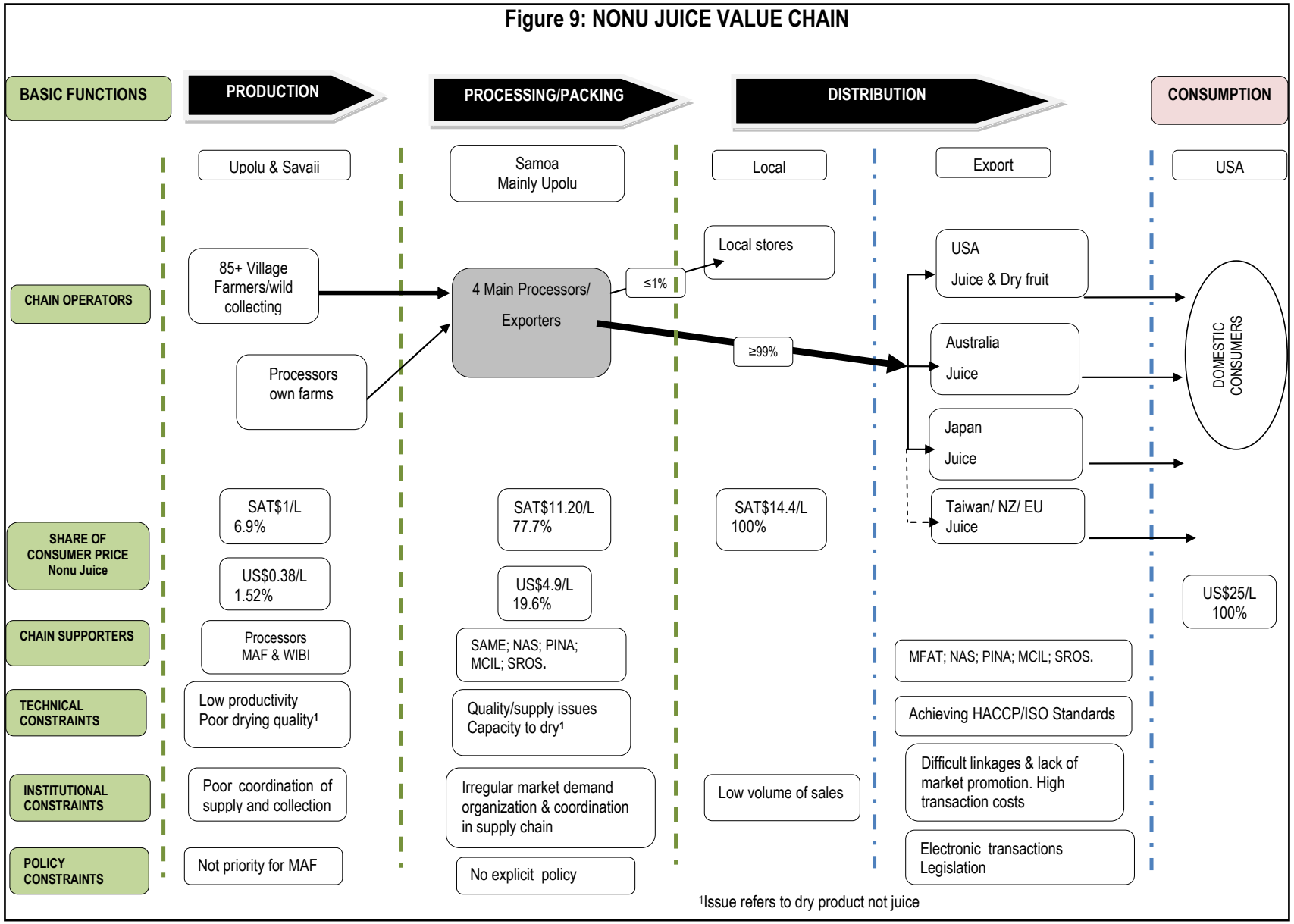


Table 3: Selection of Nonu Products Marketed by Samoan Processors

Product Description	Market
PET Bottled juice (various volumes 0.5-1.25 litre) The juice is filtered and can be pasteurised or unpasteurised. Some juice product is flavoured with local honey. Certified organic product is also available	Domestic & Export
Bulk juice in drums or bladders/Space Kraft Containers (various volumes 20 – 1000 litre) Mostly filtered but not all processors have capacity to pasteurise large volumes	Export
Sun dried sliced (chipped) fruit with or without seed, organic certified also available in limited quantities	Export
Several grades of milled nonu powder (e.g. 300 , 500, 800 and 1000 Micron)	Export
Dried nonu leaves	Export
Nonu soap	Domestic

Exporters market through direct contacts, word of mouth and through very basic internet marketing. Some processors have established regular market buyers which provide some predictability in demand, however *ad hoc* purchase is common. Processors have indicated that they have incurred difficulties in meeting *ad hoc* bulk orders for dried products because of capacity constraints in drying technology available to them. Unpredictability of the market has resulted in bottlenecks in the supply chain. Significant transaction costs are incurred by processors/exporters trying to establish and maintain markets. Some international development support has been provided for attendance at trade fair events, but generally promotion of Samoan products has lacked sufficient resources to deliver desired impact.

The industry has been proactive and dynamic in its attempt to upgrade product quality and maintain standards; most processors have upgraded plant and strive to have HACCP/ISO standards in place. Reportedly no shipments of nonu juice from Samoa have been rejected on export markets. In 2003 a regional industry association was registered - Pacific Islands Noni Association (PINA[23]) which has promoted quality standards and facilitated technical support to members in this area. In 2009 Samoan processors formed their own industry association the Nonu Association of Samoa Incorporated (NAS Inc.)[24] . With the support from a local NGO, processors have gained organic certification[25].

[23] PINA was formed in 2003 to assist in promoting Pacific Noni as the premium product in the growing global Noni market

[24] NAS Inc. objetives: i) to secure complete organization of the Association, ii) to promote, protect and maintain just and proper treatments of members in all aspects of their nonu related business, iii) to represent the interest of the members to the Samoan Government, to negotiate all matters rtelating to the promotion and development of the Nonu Industry in Samoa and iv) to do all such things as are incidental or conducive to the attainment of the above objectives. Membership to the association is open to any person who is actively involved in the growing, manufacturing, processing and marketing of Morinda citrifolia an charges a subscription of SAT$100 per annum

[25] Women in Business Development Inc. (WIBDI) has supported organic certification by NASAA of producers and processors

Processors/exporters have recognized that appellations of origin, based on strict standards, quality criteria and production methods are a useful promotional tool for their products. At present a price premium is offered to farmers by some processors for certified fruit (quoted premiums have been as much as 30-50%), whilst quoted prices for at least one processor indicate that they are selling organic product with a premium of 14-20%.

Table 3 shows the value of nonu fruit and juice to the Samoan economy and the relative share in the value obtained by the farmers and the processors.

Table 4: Value of Nonu Fruit & Juice to Samoan Economy 2000-2008

	SAT$ THOUSANDS
TOTAL VALUE NONU IN SAMOA, 2000-2008	33,438
FARMER'S SHARE IN VALUE OF NONU JUICE	5,697.5
FARMER'S SHARE IN VALUE OF DRY FRUIT	2,346.57
FARMER'S SHARE OF TOTAL VALUE	8,044.07
PROCESSOR'S SHARE OF VALUE	25,393.39
FARMER'S % OF TOTAL VALUE	24.1%
PROCESSOR'S % OF TOTAL VALUE	75.9%

The total value generated by the nonu value chain to the Samoan economy is estimated to be around SAT$ 33.5 million (US$ 13.4 million) and of this, the farmer's share of total value has been around 24% whilst the processors share has been around 76% (Table 4). However, a large share in value added does not automatically imply high profits and income. The value added of the processor includes amongst other input costs, wages, interest payments, rents, depreciation, and direct taxes. Indeed, income and profits make up only a relatively small proportion of the value added. Nevertheless, from a macro-economic point of view, the value added is a more important parameter than the income of the chain operators. Eventually, the growth generated in related service sectors should also count in pro-poor growth.

In 2005, the peak year of production, around 1.5 million litres of juice was exported which is equivalent to about 3 million kg of fresh fruit processed (assuming a 50% extraction rate), and also 167,000 kg dry fruit (8 % moisture content)was exported which is equivalent to around 768,000 kg of fresh fruit processed. Therefore total fresh fruit processed in 2005 was around 3,800 tonnes. Whilst in 2006 and 2007 respectively about 2,120 and 2,300 tonnes were processed. But by 2008 the amount processed had dropped to around 1,500 tonnes. This fall in through-put of fruit processed implies increased unit-cost of production at a time when international prices for juice have generally been declining. This inefficiency is a factor challenging the competitiveness of the Samoan product on the global market.

Reported farm yields in India (from an 8-year old nonu plantation) is about 20-25 tonnes/ha whilst potential yields in Hawaii (from a well managed plantation of 5-year old trees) is estimated at 30 -32 tonnes/ha[26] . Therefore under good plantation management around 140 ha could potentially produce the 3,800 tonnes processed in Samoa's peak year of exports.

[26] Nelson, S. (2003). Noni Cultivation and Production in Hawai'i. Proceedings of the 2002 Hawai'i Noni Conference, S.C. Nelson (ed.), University of Hawaii at Manoa, College of Tropical Agriculture and Human Resources.

3.2 SWOT ANALYSIS AND KEY SUCCESS FACTORS

STRENGTHS	WEAKNESSES
• Nonu easily propagated, grows profusely and fruits year-round in Samoa • Perennial tree-crop with potential to enhance environment • Easily integrated in traditional mixed farming system • Currently requires no external inputs and low management to sustain a yield • No serious pest and disease problems to date • A low risk commercial crop with easy entry and exit for village farmers • Significant area of land certified organic • Nonu processors certified for organic production • Value chain development is private sector driven • Relatively simple processing to add value • Experienced processors/exporters operating • Industry initiatives to form Nonu Association and maintain operational standards and quality of products • No quarantine issues for export products • Geographical compactness of Samoan islands and relatively good road and domestic sea transport network	• Limited knowledge on horticultural management of the tree to maximise and sustain yields and improve productivity • Not a priority crop for government research and extension services • Limited capacity at both farm level and processor level to efficiently dry fruit • Lack of coordination in production, processing and marketing • Limited market intelligence • Limited capacity for product promotion in export markets • Trade issues not well understood by the industry • No clearly defined government policy • Lack of scientific evidence for some claimed benefits of nonu
OPPORTUNITIES	**THREATS**
• Agronomic research and extension to improve farm productivity • SROS support for product development and quality analysis • Expansion of organic production/certification • Branding and possible fair trade label • Diversification of products • Trade facilitation support under EPA, PACER-PLUS and other development partner programmes • Support for improved fruit drying technology • Support from proposed NEA for market intelligence, penetration and promotion • Improved coordination and integration of value chain	• Increased competition on international market coupled with falling prices • Loss of consumer confidence/interest in nonu products • Failure to meet market SPS standards • Possible negative health issues due to lapse in food quality standards • Depressed farm production due to outbreak of pests/diseases or other natural disaster • Increased opportunity cost of rural labour • Macroeconomic weaknesses including high inflation and appreciating REER

SUCCESS FACTORS

Initially high international prices for nonu juice, a relatively easily available supply of fruit from existing wild-growing plants and a core of experienced processors/exporters seeking new opportunities combined to stimulate the growth of the nonu industry in Samoa. The collapse of the taro and cocoa industries from disease and cyclone damage in the early 1990's and the kava industry following import bans in key markets in 2002 and closure of the copra mill in 1999 meant that few opportunities were available to farmers to earn cash. Nonu fitted well into the traditional system and could easily be incorporated into the daily routines of semi-subsistence farm lifestyles offering a needed opportunity for spot cash earning. Nonu under current management systems is not labour intensive and is a flexible addition to the farming system which allows farmers to enter into commercial trade when the market price is attractive and easily exit when it is not. Growing wild or integrated into a traditional mixed farming system nonu can offer cash earning opportunities without negatively impacting on staple food crop production; nonu therefore has positive benefits for enhancing food security.

Agro-ecological conditions are good for year-round production of nonu fruit and there are few pests or diseases impacting production. Land access/availability is not an issue at farm level and the low input production system requires minimal cash inputs. Turning fresh nonu fruit to juice is a relatively simple process easily mastered by the local industry, which has readily invested in appropriate plant and expertise (including in food technology). Relatively few processors are in operation which has helped maintain product quality; the formation of industry associations (PINA and the Nonu Association of Samoa Inc.) has strengthened capacity and resolve to maintain industry quality standards; there has been no consignment rejected from overseas and local buyers since the beginning of the nonu industry. Processors have progressively insisted on fresh and dried fruit of the correct quality from producers.

Processed nonu products have good shelf-life and do not face stringent quarantine issues of fresh produce for access to export markets. The higher value lower volume processed products reduce to some extent freight costs. Geographical compactness of the Samoan islands and relative good road and domestic shipping network facilitate farm-gate collection and delivery of raw materials to processors.

Menz and Fleming[27] (1989) identify five major criteria that can be used to assess the value of an export crop to smallholders in geographically dispersed countries such as the South Pacific islands. These are:

1. Adaptability and ease of production, with an absence of any major pests and diseases;
2. Simple, value-adding processing activities, requiring relatively low capital investment and simple technologies;
3. Storability of the processed commodity, and resistance to damage during handling and transportation;
4. High value-weight ratio; and
5. Sound world market prospects

Nonu fits well with most of these criteria, but with the dried product better fulfilling criteria 4 than juice. Also at the current time there is something of a question mark regarding future world market prospects (criteria 5).

[27] Quoted in Andrew McGregor (2005), Diversification into High-Value Export Products: Case Study of Papua New Guinea Vanilla Industry, FAO AGSF Working Document 2, page 20.

3.3 TECHNICAL, INSTITUTIONAL AND POLICY ISSUES

Investigating why things might be working in spite of adversity and perceived constraints is a primary focus of this study. Therefore, this section overviews some of the perceived constraints to agriculture development and how these have impacted on the development of the nonu sector in Samoa.

ACCESS TO LAND

Land is central to the economic development and stability of the cultural structure of Samoa. The Samoan Constitution recognises and defines three types of land tenure: freehold, public and customary. Of the total land area in Samoa, about 81 per cent (about 565,000 acres) is estimated to be customary land, 11 per cent freehold land (about 77,100) and 8 per cent (about 57,400 acres) public land[28]. The Constitution also stipulates that customary land should be held and administered under customary law.

Under customary law there is a right for Samoans to use, cultivate, live and build dwellings on family lands provide they serve the *matai* (head of family, customary chief). Land inheritance is bi-lineal with women also acquiring land rights through their lineage. In the traditional fa'a-Samoa, the lands are owned by the extended family or aiga, just as they own the chiefly matai title to which they elect one of their members. Once elected to the family title, the matai has pule (authority) over the members of the aiga and the lands of the aiga. Therefore, under the customary land tenure system, the allocation of property rights related to village and extended family lands is based on the understanding that the right of 'use' and of 'ownership' of land is separate.

The apparent lack of 'commercial' nature of the traditional Samoan family labour and land ownership has been the subject of much debate and discussion. A generally held view is that increased security of tenure, especially when coupled with access to credit, can help poor farmers in developing countries invest more in their land, thereby improving agricultural productivity and raising farm income. Consequently some researchers have viewed the Samoan land tenure system as an impediment to agricultural development[29]

However, with the increasing importance of cash cropping, the tendency to allot portions of family lands to be worked by individuals or nuclear families has been greatly accentuated in Samoa. Newly cleared land that is held under the modified system operating today may be called *fanua totino*, "personal land", or simply as *fanua oa'u lava*, "land belonging only to me". This new land is differentiated from lands still held and worked by the entire extended family according to traditional rules. These extended-family lands are called *fanua tau le suafa o*, "Land appurtenant to the title of, or *fanua fai tele*, land worked by many (O'Meara, 1990). O'Meara maintains that the change in tenure systems has proceeded to the point where the majority of village lands is now held by individuals rather than extended families, and is inherited directly by those individuals' children, rather than indirectly through the acquisition of matai titles as in the traditional system.

[28] Asian Development Bank (December,2005) "Technical Assistance to the Independent State of Samoa: Promoting Economic Use of Customary Land,"

[29] International Monetary Fund (2007) IMF Country Report No. 07/184, Selected Issues and Statistical Appendix & Asian Development Bank. 2008. *Samoa: Private Sector Assessment—Consolidating Reform for Faster Growth.* Manila.

This dramatic change in customary land tenure is considered significant for two reasons. First, it shows that Samoans are not rigid or bound by tradition. They can and do adapt to changing economic circumstance. Second, the security of land rights is increased under the modified system because it assigns tenure to the individuals who clear the land, and inheritance rights are assigned exclusively to their children. Thus, except where the modified system may come in conflict with the Land and Titles Court. Security of tenure is much greater under the modified system than it was under the traditional system. Because of this, security of tenure is not presently considered a significant cause of low productivity in village agriculture, as it may have been under the traditional tenure system. Instead, it is the low economic return to agriculture as compared to other sources of income which is the significant cause of the stagnation of village agriculture[30] . Indeed, experience has demonstrated that in the past when markets for agricultural products have been strong (e.g. banana, cocoa, taro, kava), issues related to land tenure and land access have not been a major constraint to smallholder participation in the market. Furthermore, customary tenure has assured rural households a level of subsistence security that buffers them against the need to engage in socially or economically destructive trade[31]. Stakeholders in the nonu sector consulted in this study unanimously did not consider land access as a significant constraint to smallholder commercialisation or development of the nonu industry.

LABOUR AVAILABILITY

Smallholder village agriculture relies predominantly on family labour, but a few more commercialised farms employ some wage labour. Agricultural mechanisation is not widespread and most farm activities rely on manual labour and simple hand tools. This overall situation is true for nonu cultivation and fruit collection; therefore the availability and opportunity cost of labour are factors critical to the development and competitiveness of the nonu industry.

Generally, availability of labour has not been considered a constraint to agricultural production and commercialisation in Samoa, however various factors including, migration, remittances, seasonal overseas labour programmes, urbanisation, growth of rural tourism activities and social obligations (including subsistence food production) impinge on the opportunity cost of labour for commercial agriculture. Also, often missed in the focus on cash income generation are the many other types of work that result in village and family security and which build social capital for individuals and families. Whilst the minimum wage rate (currently SAT$2.40/hr, approx US$ 0.95) may be used in gross margin analysis, the actual opportunity cost of family/village labour to participate in commercial agriculture may be considerably higher. What appears clear is that high returns to effort are critical to encourage participation of semi-subsistence farmers in more commercial agriculture. Unfortunately, there is no data on either land or labour productivity for nonu in Samoa and hence no information on which to establish current returns to effort. In the early years of the nonu market growth processors are reported to have paid a farm gate cash price of SAT$1 per kg for nonu fruit, whilst at market lows the price dropped to as little as SAT$ 0.20 per kg; a price many farmers considered too low to justify effort.

FINANCE

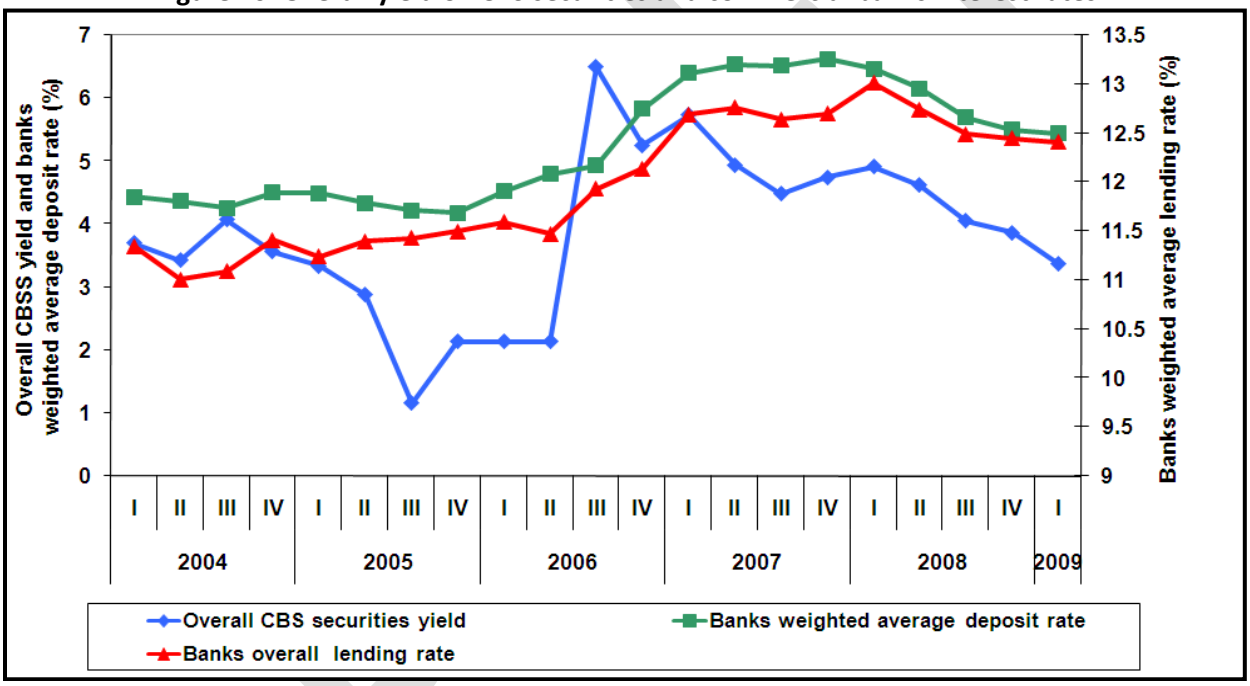
Four commercial banks, the Development Bank of Samoa, the Samoa National Provident Fund, two microfinance programs, and one small business finance program run by the Small Business Enterprise Centre (SBEC), provide business development finance (credit) in Samoa. Reported interest rates over recent years have ranged from 11% to 13% from commercial banks (Figure 10) and 20% to 22% for

[30] Samoa Agriculture Census (1999) section 2.19
[31] Deborah Paulson and Steve Rogers (1997) Geoforum, Vol 28, No 2, pp 173-187

microfinance. Lending to the agriculture sector and manufacturing has comprised a small proportion of commercial bank's loans and has shown little or no growth over recent years (Figure11). The Development Bank of Samoa is the major lender to agriculture and, since 2004; more than 50% of its lending has gone to the sector. While bank management indicated that it will continue to support the sector because of its importance to food production, it also noted the higher levels of risk. These risks have contributed to a high rate of default loans in this sector which at end of FY 2007, represented 68% of total default loan repayments. With limited market outlets for agriculture produce, the risk of default loans would continue to be a concern to the Bank, and would be taken into account in DBS future lending to the sector[32].

The largest provider of microfinance for productive use is the South Pacific Business Development Foundation. A charitable foundation registered in Samoa and the United States, it provides small, unsecured loans to groups of rural women and others. It uses a group guarantee system similar to that used by the Grameen Bank. WIBDI also run a small microcredit scheme, but it only has some 80–100 loans outstanding. Its small number of loans reflects caution in giving loans, which generally carry interest rates below those of profitable microcredit institutions in other parts of the world[14].

Figure 10: Overall yield on CBS securities and commercial banks interest rates

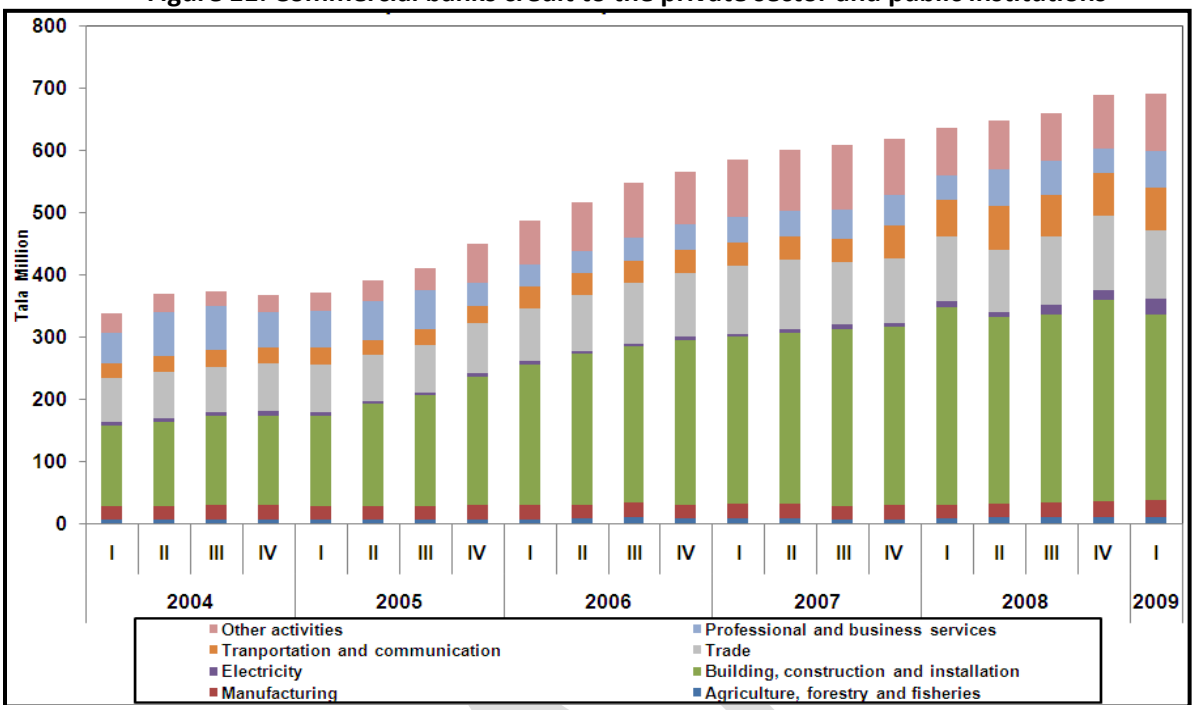


Source: Central Bank of Samoa Bulletin, June 2009

Apart from in 2006 when there was a liquidity crunch in the banking system commercial credit has generally been available for productive business development, but at a high price! Nonu processors/exporters do use commercial bank credit (overdraft facilities) for their business operations. Some have also invested profits from early "boom" years into infrastructure development and to diversify their business activities. Nonu growers/collectors use low-input systems and their operations are not considered to have been constrained by lack of credit.

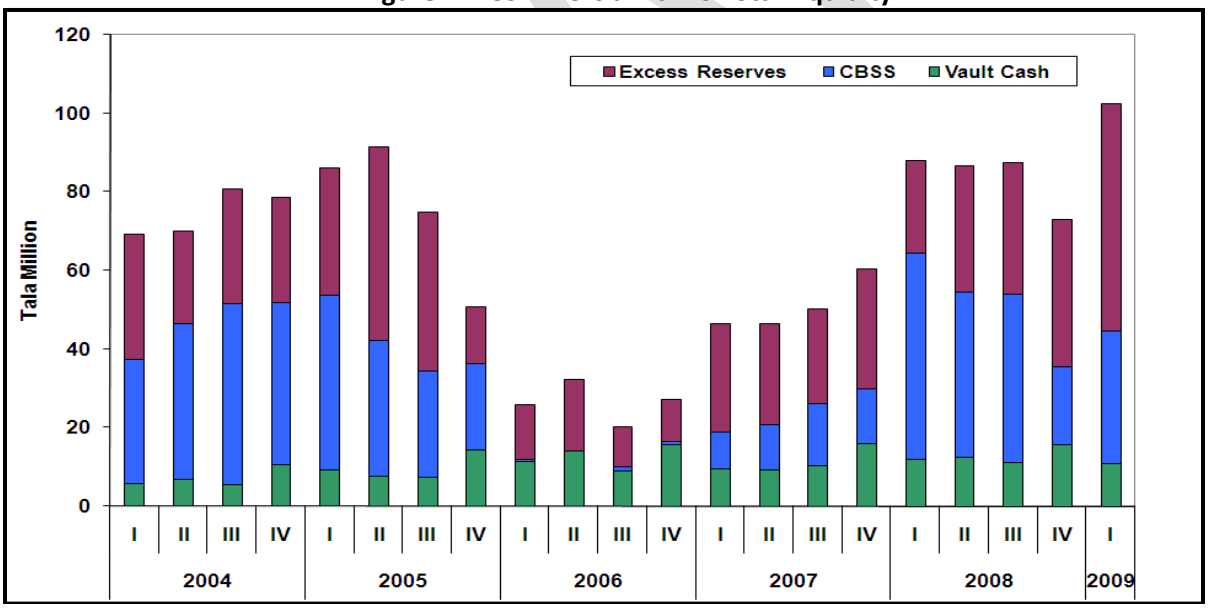
[32] Development Bank of Samoa (2007) Annual Report

Figure 11: Commercial banks credit to the private sector and public institutions



Source: Central Bank of Samoa Bulletin, June 2009

Figure 12: Commercial Banks Total Liquidity



Source: Central Bank of Samoa Bulletin, June 2009

Public support for nonu industry development (government finance and donor funds) has been very limited to date. Some technical assistance has been provided to support product quality improvements (e.g. HACCP training) and some assistance has been provided for attendance at promotional events such as trade fairs. Processors have indicated constraints in financing capital improvements in plant (for pasteurising juice) and for better drying technology. Some processors indicated difficulties when dealing

with applications for donor finance. The President of the Samoa Nonu Association hoped that this recently formed institution would help attract and facilitate public-private partnerships to support the industry.

A "Duty Suspension Scheme" was introduced by Cabinet decision in late 1999 to encourage and assist exporters who produce mainly for the overseas market. The scheme is designed to assist regular exporters to import raw materials/inputs required for export production without prior payment of duty, but some processors complained of difficulties in the bureaucratic process to access this scheme. The subsequent tariff reforms outlined below have removed duty on most inputs for nonu manufacturing.

Major tariff reforms were undertaken in the 1999 and 2000 budgets. The tariffs on most business inputs were reduced to 10% (from previous rates of 35% to 42%) and on most consumption goods to 10–20% (from rates of 50% to 60%). Some remaining anomalies were addressed by the Subcommittee on Tariffs in recommendations delivered to the Ministry of Commerce, Industry and Labour in April 2007 and subsequently approved by Cabinet.[33] These recommendations related principally to the removal of tariffs on business inputs such as animal feed and packaging materials, fishing gear, tools and equipment used in handicrafts, and raw materials used in the garment industry[14] .

Further government assistance is available under a scheme to support development of motels /hotels/beach resorts and manufacturing enterprises. The benefit of this assistance is accorded to exporters within the manufacturing industry to import duty free building materials, plant and equipment directly involved in the production of exported products. Strict conditions apply. Nonu processors have made use of this assistance.

HUMAN RESOURCES

Nonu is a familiar plant in Samoa, but it has generally been growing wild or removed as a weed from productive areas. Therefore little indigenous knowledge is available for cultivation as a commercial crop. Nevertheless, nonu's prolific growth has made it a relatively easy crop for Samoan farmers to tend and sustain a yield from. This has been a fortunate factor as little research and extension support for development of the crop has been provided by government services.

Participation in the industry by several experienced agri-business entrepreneurs in Samoa has been vital to the success of the processing and exporting of nonu products. The main players are generally very experienced business operators and have supplemented their knowledge and skills with appropriate technical skills support. Some have considerable experience with agri-business and trade. Their willingness to innovate and take risks has been invaluable for the development of the nonu industry. Without the resources and investment of these business operators the nonu industry would not have flourished in Samoa. Most of these entrepreneurs run diversified business activities which helps ensure their viability in a challenging market environment. However, there is risk that processors with diversified business activities will more readily abandon nonu if profits drop (due to lower world prices and farmers reluctance to harvest at lower farm-gate prices), which would effectively kill opportunities for farmers to market their crop.

[33] Samoa. Subcommittee on Tariffs under the auspices of the Trade, Commerce and Industry Development Board, *Tariff Review Report* (Apia: Ministry of Commerce, Industry and Labour, April 2007).

A culture of entrepreneurism with associated skills in business practice is not widespread in Samoa, particularly in traditional rural village societies. The key industry drivers in the nonu sector have largely come from ethnic and/or family backgrounds which have a developed business culture.

ACCESS TO PRODUCTION INPUTS

The current nonu production system is low input and does not rely on input market supplies. To enhance market appeal of Samoan nonu there is generally a preference for growing in an organic production system without the use of inorganic fertilizer, herbicides and pesticides. In the early years of nonu production planting materials (seedlings) were provided by some processors. Nonu can also be propagated from cuttings.

Simple traditional woven coconut leaf baskets used for collecting/carrying fruit

Source: Nonu Samoa Website

Nonu processors incur high costs and inconvenience because they have to import their packaging materials such as bottles, boxes, storage drums and also order their labels overseas. Reportedly, some suppliers have refused to supply with packaging materials because orders were below the minimum quantity. The processors reported that this aspect of their businesses has proven to be very expensive over the years.

INFRASTRUCTURE

The Samoan nation is geographically compact by Pacific standards, with the two main islands accounting for almost all of the total land area of 2,820 km^2 which eases transport and public service delivery. Adequate road[34] and domestic shipping infrastructure is available to connect nonu producers to markets. Most nonu processors have organised farm-gate collection and payment using their own vehicles[35]. Processors also purchase at the factory from producers who can deliver with their own transport. Whilst escalating domestic fuel prices have impacted on the costs of transport Samoa has maintained relatively competitive fuel prices at the pump compared to other Pacific island countries. In 1998, the government introduced and controlled effectively new supply and pricing arrangements by owning all petroleum storage facilities and tendering out operation to a supplier every five years. They have also separated the supply of fuel from distribution leaving this to local businesses. As a result of this arrangement Samoa has been one of the countries in the region with lowest wholesale and retail fuel prices[36]. In contrast, Electricity costs are among the highest in the Pacific reflecting the rising cost of

[34] There are 880 kilometers of roads, over 90% of which are paved

[35] All processors/exporters have collecting trucks that are usually sent around Upolu and Savaii to collect fruits, but agents in respective districts also pick and transport dried nonu.

[36] Energy Review 2008, Ministry of Finance. http://www.mof.gov.ws/publish/

fuel inputs, the inefficient tariff structure, and shortfalls in management of the state-owned monopoly. A 15% tariff increase was made effective in early 2007, representing the second 15% tariff increase since 2001[33].

There are four deep-water ports in Samoa at Apia, Mulifanua, Salelologa and Asau, but the Apia Port is the sole commercial Port handling 97% of all foreign trade cargoes. It has in the past couple years undergone an extension to its berth, container storage area and container park. The Apia Port now provides two berths, a 12,700 square metres container yard, two cargo sheds (2,541 square metres and 2,486 square metres) and a staging area of 4,500 square metres giving it an increased capacity to receive more shipping tonnage. In addition to this, the Port offers two 25-ton pollard pull tugboats for berthing Manoeuvure[37]. International shipping lines service Samoa fortnightly and provide services to New Zealand and Australia via the Fiji Islands, Tonga and the Cook Islands. The Greater Bali Hai operates fortnightly to and from Apia, Japan and Korea. It also provides fortnightly services between Fiji, Apia, Pago Pago, Papeete, Nuku'alofa, Noumea, Santo, Honiara and Noro. The Polynesia Line services Apia, Los Angeles and San Francisco[37]. Container fees are ST230–350 per container, at par with those of regional ports. Users consider the port as quite efficient, with faster turnaround times than others in the region[13].

No detailed investigation of processors technical plant was made in this study, but it is generally observed that processors have invested in appropriate technology (which is not very complex), but not all have been able to secure pasteurising equipment to deal with bulk juice quantities, also equipment is not currently available to sterilized dried fruit products. Processors indicated their lack of capacity to efficiently dry fruit and a need for improved technology for this.

Solar drying of fruit

Source; Nonu Samoa Website

Whilst all processors have IT equipment not all have a website to advertise and market their products. Modern commerce (including global nonu trade) increasingly involves electronic exchange—from electronic signatures on contracts to purchasing over the Internet. The ability to perform commercial transactions electronically greatly reduces the costs of contracting and is especially important for countries that are far from the main markets with which they deal. However, to fully utilise electronic exchange, Samoa will first need to develop its legislation in this area.

INFORMATION

[37] Pacific Islands Trade and Investment Commission, Sydney." *Doing Business in Samoa*".

Supply and sharing of Information is possibly one of the weakest areas in the development of the nonu industry. There is little information available to farmers on tree management and improved production technology, or on the gross margin and returns to effort under different management systems. Despite nonu having been Samoa's largest agricultural export for several years it is not a priority crop for MAF.

No consolidated and up-to-date information is readily available on the world market. Lack of rigorous scientific evidence on claimed health benefits for nonu products poses a potential risk to sustained future market demand. Processors indicated that they rely largely on their own research for information on processing technology and markets. PINA has provided support in this area, but some processors have commented on the high membership costs[38] in return for limited services provided. This has led to a system of "group" representation through the SAME, but this means that processors do not have an individual voice in the decision making processes of the organisation. Recently several of the processors in Samoa have initiated a local Nonu Association and included in the membership at least two Nonu farmers.

FACILITATION AND LINKAGES

The nonu industry in Samoa has been developed through private sector drive and facilitation with no specific government support having been accorded. Indeed, government has no particular policy on nonu and remains largely reactive towards industry needs. The Samoan Nonu Association could help to strengthen dialogue and linkages with government services. Areas for potential government support are in productivity research and extension, product development and quality assurance, market intelligence, product promotion and trade facilitation. The SROS could be a strong partner to the industry assisting with product development and quality assurance. The MCIL and MFAT retain an important role to fulfill to support market development and to facilitate trade. In order for this support to be forthcoming government first needs to accord a higher priority to the country's most significant agricultural export industry.

Continued support and facilitation by WIBDI for organic production and certification will be important to help differentiate and add value to Samoan nonu products on international markets.

CONTRACTING

The nonu economic exchange system is market driven with international market demand and prices being the key drivers attracting and sustaining local agri-business participation in the value chain. International demand and prices directly impact on processor/exporter operations and profits. International market signals also impact on the prices paid to produces, but not directly, as these prices are modified both by processors' transaction costs and profit motives.

Nonu growers act as individuals in the nonu economic exchange system which limits their power to negotiate with buyers. Periodic acute needs for cash (e.g. to pay school fees or for family *faalavelave*) may impel them to take low spot prices offered by processors. However, during times of good international market demand, there has generally been a good level of competition with up eight or nine processors buying fruit which has helped to hold up prices for growers. Furthermore, the combination of the strong subsistence base and communal system operating in Samoa has offered village producers the 'freedom not to trade' thus considerably increasing their 'market power'.

[38] PINA annual membership fee of FJ$ 300

However, Duncan and Nakawai[39] suggest that - "communal systems, with their strong clan loyalties, do present difficulties for the establishment of a market economy because markets depend heavily upon transactions between parties that do not know each other. The close clan ties on the one hand and the long-standing distrust of other groups on the other hand mean that there is little of the kind of trust (social capital) that is needed in a market economy". This situation is apparent in the nonu supply chain where producers generally have a strong mistrust of processors and are critical of what they believe to be excessive profits made by them. In contrast, some processors have expressed views that producers expect high payment for little effort and that they do not understand market systems or appreciate processors high operational costs and risks.

At the international market level processors incur high transaction costs for negotiating, monitoring and enforcing contracts. Frequently sample products are dispatched to potential buyers, but this does not always result in future orders made. One processor also reported difficulties with significant unpaid bills for delivered orders. Most processors have some established buyers to which they can accord favourable prices because the mutual trust between sellers and buyers has reduced transaction costs for both parties, but further development in this area of international contracting is desirable.

3.4 MAINTAINING A COMPETITIVE ADVANTAGE

Global markets are dynamic making "competitiveness" a moving target, the capacity to innovate and respond to change to keep up with competition is therefore an important attribute necessary in a modern market economy. Samoan nonu has enjoyed a comparative advantage to date due to the natural resource base, but significant efforts will need to be devoted to maintaining competitiveness in a changing world market.

The global market for nonu is reportedly contracting[40] at the same time as new players in the Philippines, Malaysia and India are entering into production. These new players have good processing capacity and the ability to reduce unit cost of raw materials under plantation mode of production. Samoa needs to increase the efficiency, organization and innovation in the supply chain. There is considerable opportunity to increase both land and labour productivity as virtually nothing has been done in this area to date. A particular priority is to establish a profile and gross margin for nonu production under different management systems in order to better inform farmers on ways to lower output costs whilst also improving returns to effort.

Coordination of farm supply with processors demand is another area which could be improved. Currently wastage occurs due to the timing of collection from farmers and the ad hoc market demand. Loss at the farm-gate of ripe fruit which is not purchased reduces returns to effort and increases farmer's disillusionment in the industry. Whilst the opportunity to dry fruit and hence use more of the ripe product is available to farmers, capacity to dry the fruit is limited and this often results in poor quality product which is rejected by the processors. Simple solar drying technology could be explored for use at village level to improve the efficiency and effectiveness of fruit drying and thus reduce rejections and improve returns to effort. Improved drying technology at processor level is another potential area

[39] Ron Duncan and Haruo Nakagawa. (2006). "*Obstacles to Economic Growth in Six Pacific Island Countries*", World Bank, Washington, DC.

[40] Local processors quote world nonu market value as US$ 800 million in 2006, US$ 640 million in 2007 and US$ 570 million in 2008. Source of this data is unknown.

for investment. Currently processors have indicated that they are constrained to meet market demand for quality dried products.

The small processors in Samoa will increasingly have to compete with larger scale nonu manufacturers that can benefit from economies of scale in processing technologies. Increased through-put and consistency of operation for processing plants would improve efficiency and reduce unit cost; however this is largely dependent on securing predictable export market demand. With increasing price competition it will be essential to maintain high quality products and differentiate and brand these accordingly. Nonu products generally enter a "luxury" health-food market with demanding requirements on quality and other environmental issues of production. These factors may be more important for consumer choice than simply price. There seems to be opportunity in Samoa to expand certified organic production of nonu and possibly link this with "fair trade" marketing. Currently organic production in Samoa has high level political support and there is a concerted regional effort to enhance capacity and opportunities in this area. In 2005, 104 tons of organically certified nonu was exported, which amounted to an increase of 50% from the previous year. The nonu industry needs to take full advantage of this positive development environment. Women in Business Development Inc., a non government organisation, are currently the only organisation assisting farmers (and sometimes villages) in obtaining organic certification. Currently, 3 nonu processing plants, and 213 farmers including one whole village, are organically certified to international standards by the National Association for Sustainable Agriculture, Australia Limited (NASAA).

In December 2004, through efforts of PINA and with development assistance from the ACP-EU Centre for the Development of Enterprise (CDE), 26 Pacific island nonu processing companies received approval to export nonu juice to the EU member states. However, despite the potential access to the EU, Samoan processors have to date failed to significantly penetrate this market. Improved market intelligence, linkages and promotion are key factors for market development. The relatively small nonu industry in Samoa does not have the resources and capacity for undertaking market intelligence studies to identify market potential and specific market opportunities, or for rigorous promotion of its products. Whilst market research is ultimately a private responsibility, export promotion agencies and development programmes could be helpful in collecting and processing relevant data. A profound understanding of end markets is in the interest of all chain actors involved as they all depend on the same end consumers. Basic information on end markets has the character of a common good that is shared among chain operators and therefore there is room for government/ external development agencies to conduct, facilitate or commission market research as an essential contribution to chain upgrading[41] .

The characterisation of markets is very important since it highlights the importance of factors such as shipping frequencies and freight costs, packaging requirements, tariff and quarantine barriers, insurance and exchange rates. As such, a number of interventions are required by the government to help reverse the downward trend and stimulate the industry so as to regain export competitiveness. To that end, appropriate actions are needed to create a strong national nonu policy and a robust institutional framework, enhance the producers' technical expertise so as to improve productivity and quality and to support market development through assistance for market research and promotion. Promotion is a key factor for market development.

[41] The Value Links Manual. The Methodology of Value Chain Promotion. GTZ http://www.value-links.de/manual/distributor.html

TNI has been a key player responsible for world-wide promotion of nonu products; however the approach adopted has been to make wide scale claims for beneficial attributes with little scientific evidence to substantiate these. To date there is still a lack of clinical trials to support the many health benefits claimed for nonu. For instance, whilst there may be anecdotal evidence on the beneficial effects of nonu for blood pressure, there is no scientific evidence to support this[42] – a move forward in this area could help boost and sustain world sales and prevent nonu falling out of fashion in a dynamic health food market.

In Samoa the government is the major service provider to businesses with inputs in the ports, shipping, water, electricity and telecommunication. These activities are major cost centres in any business budget and the government needs to work towards reducing costs of these core services to help maintain Samoa's international competitiveness and enable private sector growth.

3.5 OPPORTUNITIES FOR SCALE-UP AND REPLICATION

Opportunity to scale up nonu production in Samoa is ultimately dependent on the international market demand and price. A more predictable (and possibly increased) demand might be established by stronger coordination in the supply chain through greater vertical integration. Exploring possibilities to establish supply contracts with global distributors is one avenue that could be explored.

Nonu grows extensively in most Pacific island countries and small nonu product export industries have established in several, but none[43] have rivaled Samoa's success. In the small countries of Cook Islands and Niue production has largely been in plantations integrated to processors/exporters. The level of vertical integration in the value chain will impact on the potential backward linkages to the rural economy.

Generally, it is expected that factors affecting the competitiveness of PICs in international nonu trade would be similar to those discussed for Samoa.

4. CONCLUSIONS

Like most Pacific island countries, Samoa has a very small domestic market and needs to participate in international trade to generate growth based on agricultural productivity. Therefore, they must establish international market niches that will allow them to charge prices that will cover their high international trade costs[39]. Nonu has offered such an opportunity and Samoa has seized it. A Household Income and Expenditure Survey in 2002 indicated that only 3% of household income nationally was derived from surplus subsistence produce. The experience of nonu in Samoa demonstrates how beneficial high-value niche commodities can be for semi-subsistence village farmers.

The nonu market boom in the early 2000's led to a proliferation of nonu enterprises in several Pacific island countries with Samoa emerging has the major player. However, initial comparative advantage based on widespread availability of nonu which grows prolifically in Samoa is now being eroded through increased competition from new entrants on the international market. Continued success is further

[42] Jay Ram (2003), Proceedings of the 2002 Hawaii Noni Conference, SC Nelson (ed), University of Hawaii at Manoa, College of Tropical agriculture and Human Resources.
[43] French Polynesian countries (notably Tahiti) and Hawaii are not included in this comparison.

threatened by a reported decline in international demand possibly associated with the global economic downturn.

The key factors influencing the successful development of a nonu industry in Samoa which is inclusive of small farmers are:

- ✓ Initially, expanding world market demand for nonu juice fuelled by promotional campaigns led by Tahitian Noni International.
- ✓ Duty free access for Samoa nonu products to main export markets due to LDC status and/or preferential trade agreements.
- ✓ Market entry for processed nonu products not restricted through quarantine (SPS) issues.
- ✓ A cadre of experienced agri-business operators seeking new export opportunities following the demise of kava, copra and cocoa exports.
- ✓ Relatively simple technology required for processing fruit juice and dried products to add value, together with a willingness and ability of the entrepreneurs to invest in appropriate plant and procedures.
- ✓ A determined effort by these operators to achieve and maintain high product quality standards.
- ✓ Nonu trees grow widely and profusely in Samoa, being present on most farmland areas and in "backyards" and they fruit all year round with minimum pest and disease problems.
- ✓ Access to land for nonu cultivation is not a constraint.
- ✓ Nonu produces in a low input farming system requiring only family labour to collect fruit and limited management skills to sustain a yield.
- ✓ Farmers can include nonu in their traditional mixed farming system with minimum investment or risk.
- ✓ Flexible labour demands for cultivation/collection of nonu do not negatively impact on staple food crop production.
- ✓ Where necessary processors provided planting materials to expand production and provided guidance on fruit quality required for processing.
- ✓ Farm-gate collection of fruit organised by processors and spot cash payments provided easy market access to village farmers/collectors.
- ✓ Limited cash earning opportunities in rural areas stimulated and sustained an interest in growing/collecting nonu even when farm-gate prices dropped from initial highs.
- ✓ Geographical compactness of Samoan islands coupled with relatively good road and inter-island shipping facilitated transport of raw materials from farms to processing factories.
- ✓ Samoa has adequate international shipping links.
- ✓ General political and macroeconomic stability fostered a positive environment for business development.

With increasing global competition and a depressed market environment, Samoa must explore every avenue to increase its competitiveness and market share in the international nonu market. Improving the organisation and efficiency of the supply chain will be necessary. The private sector has been dynamic in developing the nonu industry and their sustained efforts and innovation will continue to be the critical factor for future success.

However, the public sector does have an important role to fulfill to partner and assist the private sector in the development of the nonu industry. A first priority for government is to articulate a clear policy for nonu including identifying possible areas of government support and partnership.

It is recommended that a detailed participatory value chain study is implemented with all relevant stakeholders to encourage dialogue, strengthen linkages and identify key activities necessary to upgrade and promote the nonu value chain. Particular attention should also be paid to the social and cultural factors determining business behaviour. The influence of trust, the behaviour and willingness of operators to cooperate are decisive factors. However, social norms are often excluded from the discussion since they are difficult to analyse and bear conflict potential.

Low productivity of labour and land together with high opportunity cost of labour influence the relatively high price of agricultural output products in Samoa. Currently there is no crop profile for nonu and no gross margin to establish returns to effort. Government could assist further through support for research and extension to improve nonu productivity[44] and to establish basic data on nonu production under different management systems. Promoting growing nonu in agroforestry systems would enhance diversification and avoid dependence on single commodities thus reducing the risks associated with the vagaries of the world market.

Nonu is high-value niche commodity sold on the luxury health-food products market. This market has very demanding quality requirements and is sensitive to environmental and social aspects of production systems. Samoa has demonstrated a comparative advantage for organic production and has made good progress in organic certification. There is high level political support for organic agriculture in Samoa and this should be capitalised on to expand production of certified organic nonu products.

The capacity to efficiently dry nonu fruit at farm and processor level is resulting in wastage and negatively impacting on production efficiency. It is also excluding Samoa from potential markets because they are currently unable to consistently meet market demand for quality (including organic) dried products. Public-private partnerships could be explored to assist in upgrading the capacity to dry fruit at both farm and processor level.

The relatively small nonu industry in Samoa does not have the resources and capacity for undertaking market intelligence studies to identify market potential and specific market opportunities, or for rigorous promotion of its products. Large global players are spending huge amounts on market penetration in new potential markets such as China. Government should consider how it can best assist private sector in the area of market development. Establishment of the proposed Samoa Export Authority (SEA)[45], to focus on addressing production, marketing, quality, financing and other related export issues would be a positive step.

The Samoan government has recognised the importance of the private sector in agricultural development and the need to work effectively with them. The SDS cites support for the private sector as a key strategy for enhancing competitiveness and value addition. Unfortunately, there remains a notable gap between policy statements, strategy and practical actions. An important challenge facing

[44] Productivity **:**The amount of output per unit of input, e.g. the quantity of a product produced per working hour or per hectare

[45] The Samoa Export Authority was pproposed to be established in the National Export Strategy endorsed by government in 2008.

government is to work more proactively with the private sector in developing and implementing policies and strategies to support agricultural development generally and the nonu sector specifically.

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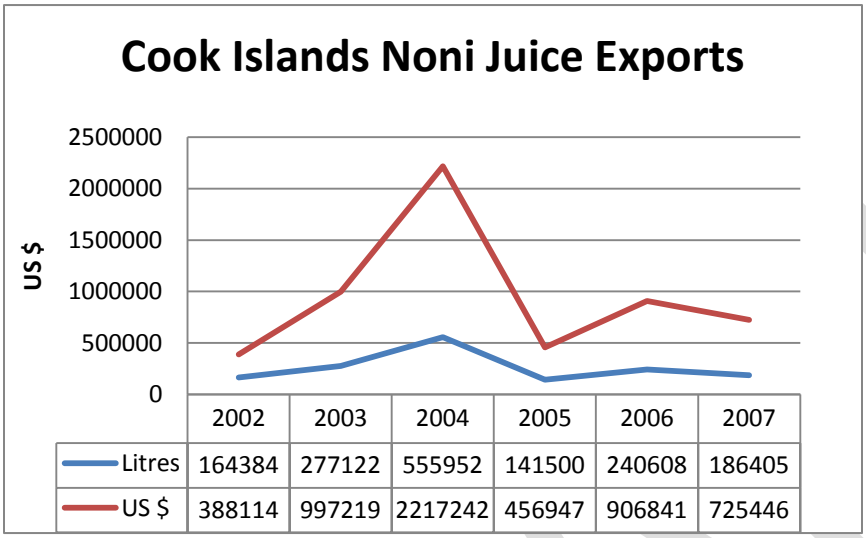
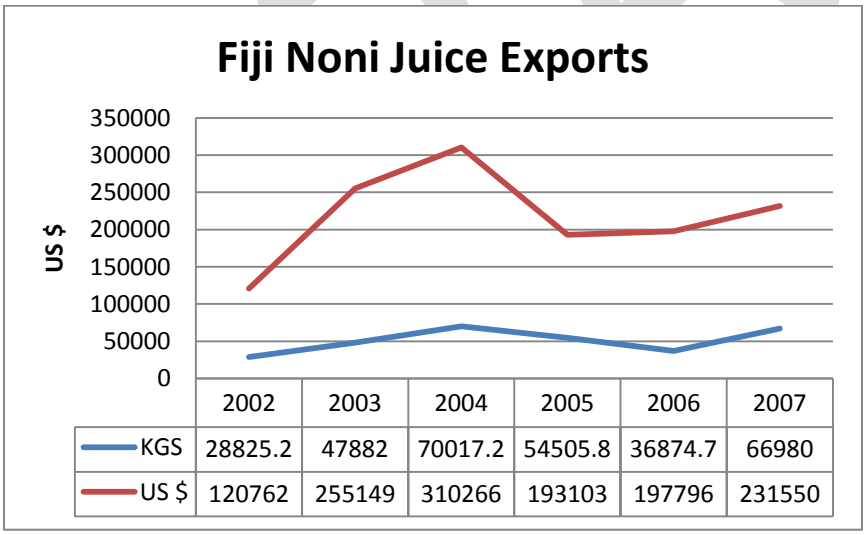
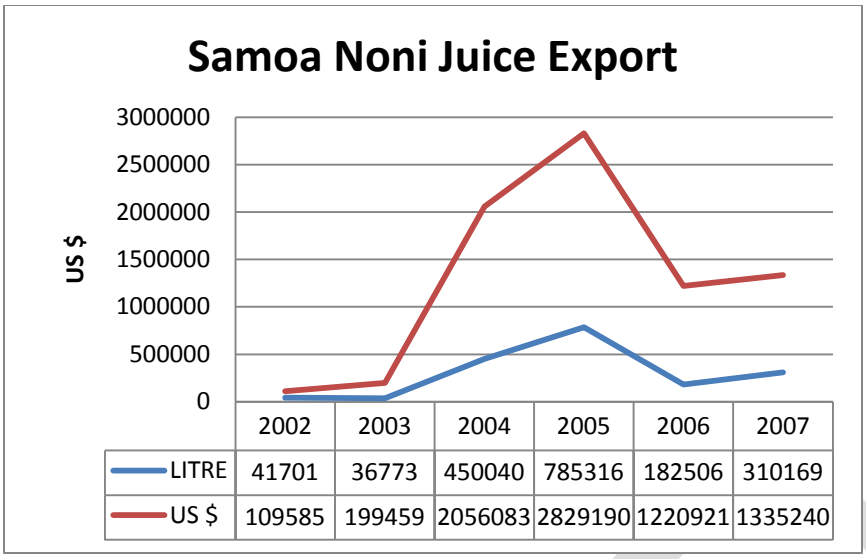
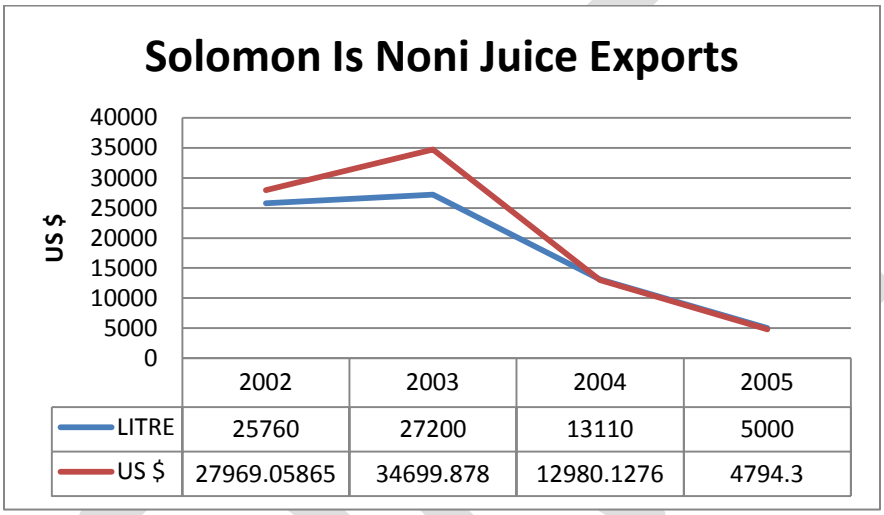
ANNEX 1.

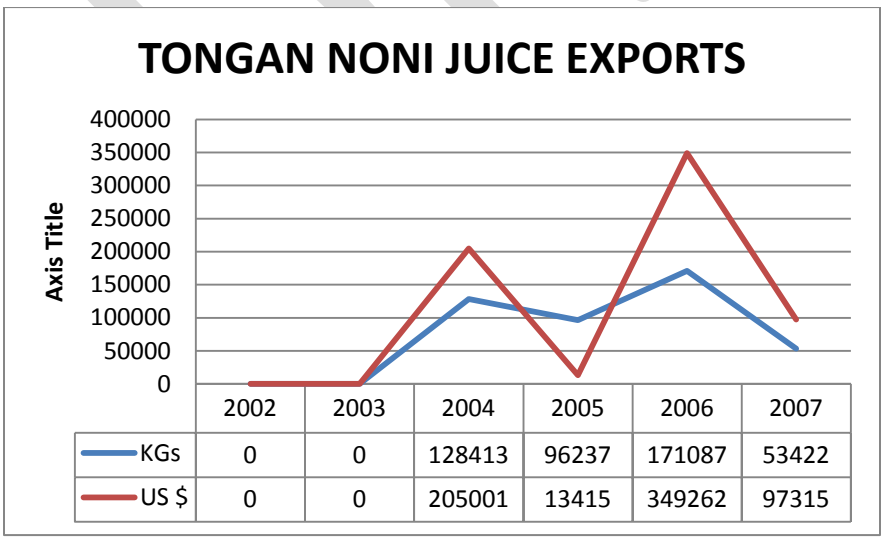
Noni Juice Exports from 6 Pacific Islands (Data sourced by Tim Martyn from the *SPC Regional Trade Statistics Database*).

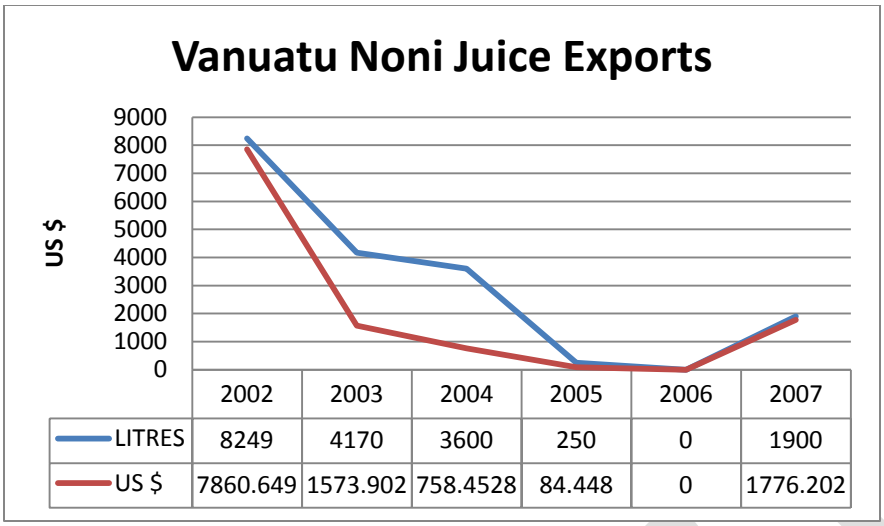





Samoa Noni Juice Export
US $
3000000
2500000
2000000
1500000
1000000
500000
0
2002 2003 2004 2005 2006 2007
LITRE 41701 36773 450040 785316 182506 310169
US $ 109585 199459 2056083 2829190 1220921 1335240


Solomon Is Noni Juice Exports
US $
40000
35000
30000
25000
20000
15000
10000
5000
0
2002 2003 2004 2005
LITRE 25760 27200 13110 5000
US $ 27969.05865 34699.878 12980.1276 4794.3


TONGAN NONI JUICE EXPORTS
Axis Title
400000
350000
300000
250000
200000
150000
100000
50000
0
2002 2003 2004 2005 2006 2007
KGs 0 0 128413 96237 171087 53422
US $ 0 0 205001 13415 349262 97315



	2002	2003	2004	2005	2006	2007
LITRES	8249	4170	3600	250	0	1900
US $	7860.649	1573.902	758.4528	84.448	0	1776.202