

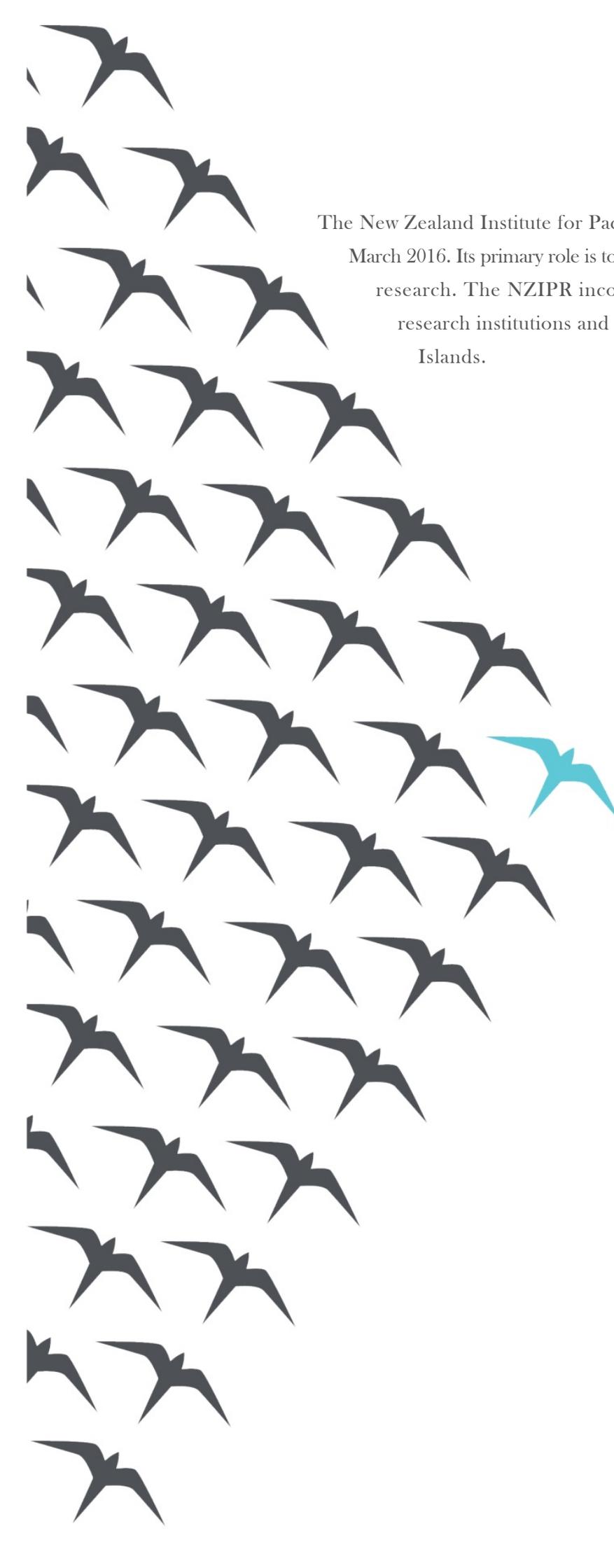


NEW ZEALAND
INSTITUTE FOR
PACIFIC RESEARCH

*Opportunities to Improve
Vanilla Value Chains for Small
Pacific Island Countries*

Sisikula Palutea Sisifa, Betty Ofe-Grant and Christina Stringer





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The New Zealand Institute for Pacific Research (NZIPR) was launched in March 2016. Its primary role is to promote and support excellence in Pacific research. The NZIPR incorporates a wide network of researchers, research institutions and other sources of expertise in the Pacific Islands.

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List of Acronyms

DAFF	Department of Agriculture, Fisheries and Forestry (Niue Government)
FAO	Food Agricultural Organization of the United Nations
GDP	Gross Domestic Product
GVC	Global Vanilla Chain
HIES	Household Income and Expenditure Survey
IFOAM	International Federation of Organic Agriculture Movements
MAFF	Ministry of Agriculture and Fisheries
NGO	Non-Governmental Organisation
NIOFA	Niue Organic Farmers Association
NVI	Niue Vanilla International
ODA	Official Development Assistance
PIFON	Pacific Island Farmers Organisation Network
SAT	Samoa Tala
SDG	Sustainable Development Goals
SDS	Strategy for Development of Samoa
SPC	Pacific Community (regional agency)
SROS	Scientific Research Organisation of Samoa
STEC	Samoa Trust Estates Corporation
TCP	Technical Cooperation Programme
UNDP	United Nations Development Programme
WIBDI	Women in Business Development Incorporated

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1. The Value of Vanilla for the South Pacific

1.1 Introduction

Agriculture remains the backbone of Pacific Island economies. However, over the past decade, traditional cash crops such as copra, and taro has provided insufficient financial returns to local farmers. Subsequently, governments and development agencies, along with farmers themselves, are seeking new agricultural opportunities. Vanilla production has become the new cash-crop buzz in the South Pacific.

Vanilla is a popular spice in global demand. In recent years, vanilla has been referred to as brown gold as prices have soared; indeed, the term brown gold was used to describe vanilla production back in Tonga as early as 1997 (Van der Grijp, 1997). The price for the spice is second only to saffron (Moreno-Ley et al., 2019). In 2015, the price of vanilla was US\$85 per kilo and by 2018 vanilla had reached its peak selling price of US\$600 per kilo (also briefly surpassing the price of silver) (Pilling, 2018). The vanilla industry is subject to price volatility and climatic uncertainties. As the price increases and more farmers plant vanilla crops this ultimately has an impact on selling price. Over time, farmers can be deterred from growing vanilla due to the time needed for growth and maturity (up to 3 to 5 years). Further, crops are susceptible to cyclones and droughts. The value of vanilla is such that in Madagascar, the top growing country for vanilla, farmers need to take security measures to protect their crops.

Geographically, there are areas in the Pacific, which are climatically suited to growing vanilla (Taylor, McGregor, & Dawson, 2016). Vanilla is seen as a crop that can contribute to sustainable development in the

Pacific. Governments and others have become strong advocates urging locals to tap into the lucrative vanilla market. As an illustration, the Government of Samoa has encouraged local farmers to cultivate vanilla by offering agricultural loans to help establish and, in some cases, develop existing farms. As one farmer commented: “I am beyond thankful that government has taken notice by resurrecting the interest in vanilla farming with the appropriate government thinking tanks taking the lead in securing overseas markets for us.” The Cook Islands Government has also provided support funds in order to increase the number of growers, as well as for opportunities for growers to tap into the global market: “Local vanilla growers have been told that their best chance of building a successful export brand will be to band together and form a co-operative enterprise.” (Chapman-Smith, 2014).

Companies are also involved in the development of the vanilla industry in the Pacific, for example, New Zealand-based Heilala Vanilla and the Australian company Queen Fine Foods both currently operate in Tonga. Heilala Vanilla has shown interest in sourcing vanilla beans from the Cook Islands. These companies provide a channel to market for growers through their incorporation into regional value chains. Recognising potential opportunities to be incorporated into commercial value chains, one Samoan farmer commented: “For Ross Appleton from New Zealand and his company Equagold, Samoa is one of the countries that might show great potential when it comes to the process of growing and selling vanilla globally.”

Admittedly, the vanilla industry in the Pacific Islands is small compared to other key producing countries. In 2017, Madagascar produced 3,227 tons of the world's vanilla production followed by Indonesia at 2,402 tons. To put this into context in relation to

the Pacific, where three countries are ranked in the top 10: with an output of 499 tons and 181 tons of vanilla respectively, Papua New Guinea and Tonga are ranked fifth and eighth (FAOSTAT, 2017). French Polynesia shares the tenth spot.

1.2 Aims of the Project

Pacific Island economies have traditionally relied on the agricultural sector (Evans, 1999; Storey & Murray, 2001). The commercialisation of agricultural products such as squash and vanilla, in Tonga for example, has been important for income generation in villages (Storey & Murray, 2001). Yet commercialisation has also presented challenges.

The vanilla sector in each of the countries covered by this report—the Cook Islands, Niue and Samoa—is at the nascent stage of development with the potential for commercialisation and upgrading opportunities through participation in commercial value chains. The aim of this project is to understand how the vanilla sector is being developed and, in particular, what types of linkages are being established to regional and/or international markets.

Four key research objectives guide the report:

1. Examine the extent to which the vanilla industries in the Cook Islands, Niue and Samoa have been incorporated into viable commercial value chains;
2. Critically assess the potential impact of the incorporation of the vanilla industry into commercial value chains on sustainable economic and social development in each of the countries;
3. Identify key drivers or constraints in achieving upgrading opportunities;
4. Assess the means by which public/private partnerships can successfully provide market access opportunities to farmers.

1.3 How the Research was Conducted

The majority of the research conducted on the vanilla sector in the Pacific region is quantitative in nature. A large portion of this research examines the biodiversity properties of vanilla (see, for example, Bory, Grisoni, Duval & Besse, 2008) and vanilla viruses in the Pacific region (see, for example, Grisoni et al., 2004; Grisoni et al., 2006; Pearson, Jackson, Pone, & Howitt, 1993; Wisler, Zettler, & Mu, 1987;). There are few studies focusing on the export markets for non-

traditional agricultural crops such as vanilla in the Pacific (McGregor, 2004, 2007).

This research used a qualitative research approach. The research design was informed by a range of Pacific world-views and fashioned to respond to the different Pacific contexts. Pacific cultural values underpin this research and emphasise Pacific research principles such as reciprocity, holism and axiology where the outcomes of the study are

of value and accessible to the communities in question. Reciprocity is an integral component of conducting research in the Pacific. It constitutes the core of collective values and is the glue that binds the social capital of indigenous communities (Massey University, 2017). This principle is practised in the field

1.4 Data Collection

We conducted semi-structured interviews and talanoa sessions with participants in New Zealand, Niue, the Cook Islands and Samoa. In addition, secondary data in the form of industry and government reports, training manuals and other forms of documentation were obtained from government ministries, regional agencies, vanilla buyers and contacts in the field. Little quantitative information by way of vanilla statistics was available.

Considering the different Pacific indigenous groups involved in this study, it was necessary to employ a research method that was culturally appropriate and transferrable across contexts. The talanoa research method was used for this reason. The talanoa research approach allows for culturally appropriate and contextual interactions with Pacific participants. Further to this, “talanoa firmly places the power to define what the Pacific issues are at the centre of the encounter between the researchers and

1.5 Report Structure

Section 2 discusses global value chains and the importance of, and criteria for, inclusive development. This is followed by an overview of the vanilla industry (Section 3) and an examination of the vanilla industry in the Pacific (Section 4) is given. Research was undertaken into the global industry as well as the wider Pacific in order to put

by the researcher and participant willingly sharing or exchanging information and stories. By using these principles in the field, our research team was able to conduct culturally appropriate talanoa sessions in a way that made participants feel safe, valued and heard.

participants” (Vaioleti, 2011, p. 128). We conducted talanoa sessions with individual participants to allow them to freely engage and share their insights. Individual talanoa sessions were appropriate in this context due to the sensitive nature of the discussion—i.e., a farmer’s financial stability, perceptions of government support, etc.

A purposive sampling method was used to identify and select participants within these groups. Our research team used our networks within the respective islands to identify potential participants.

We conducted talanoa sessions with department heads within government, private sector actors, farmers, community leaders, and other relevant stakeholders. The research team undertook field trips to each of the countries from June 2018 to November 2018. In total, 27 participants was involved in this study.

developments in the three countries—the Cook Islands, Niue and Samoa—into context. The report focuses on each of the three countries (Section 5, 6, and 7) before looking at the opportunities and challenges for vanilla in the Pacific in Section 8. The report concludes with recommendations.

2. Value Chains and Inclusive Development

2.1 Global Value Chains: What Are They?

The global value chain (GVC) framework is an analytical approach which focuses on international production networks and, importantly, on how industries in countries can be incorporated into international production networks. For many developing countries, becoming incorporated into GVCs—or in other words commercial value chains—is vital for economic and social development.

The value chain describes the range of activities to bring a product from conception to end use. There are four key dimensions to a GVC:

1. An input-output structure which encompasses the transformation of raw materials into finished products (see Figure 1). In the case of agricultural products, an input-output structure would encompass all links in the chain from farm to market. The input supply stage includes financing, research and development, and seedlings needed to produce a product. It then moves onto production, the various stages of processing and end markets;
2. A governance structure which refers to firms that co-ordinate the value chain and how they control value. These can be local, regional or global firms. Such firms are commonly referred to as lead or buyer firms as access to finance or markets can only be accessible through their networks;
3. The institutional context refers to the institutional framework, both formal and informal, in which firms are embedded. For example, what the respective governments are doing to facilitate the development of vanilla; or what their quarantine restrictions are in exporting vanilla; and
4. Geographic scope—where is each link of the chain located and why?

Figure 1 Simplified input-output structure.

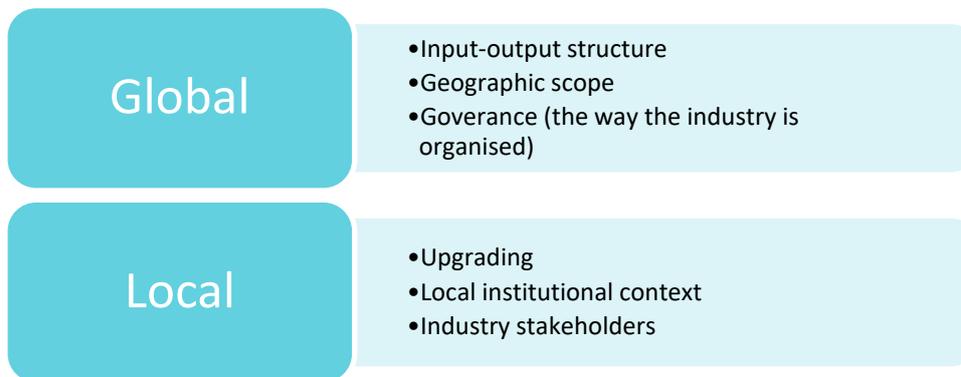


The GVC framework analyses the characteristics of actors at each node of the value chain, including lead firms which govern the chain through, for example, market access opportunities to local farmers seeking to improve productive capacity and capture more value. Further, the GVC framework

examines how competitive the industry is globally, how downstream markets are organised, and, importantly for this research, whether linkages along the chain are strong.

We can also look at a GVC from two contrasting perspectives—global (top-down) and local (bottom-up) (see Figure 2).

Figure 2 Six dimensions of the GVC analysis.



Source: Gereffi and Fernandez-Stark (2016).

The local or bottom-up dimension includes upgrading which is how producers can add value. The role of industry and other local stakeholders is important in understanding how local producers can upgrade (Gereffi & Fernandez-Stark, 2016). Stakeholders include, for example, companies, workers, and government agencies. Key to GVC analysis is an understanding of how “each stakeholder plays a role to contribute to development of the sector” (Gereffi & Fernandez-Stark, 2016, p. 14). GVCs are embedded in local institutional contexts and depend “significantly on these local conditions... [and] the availability of key inputs: labor costs, available infrastructure and access to other resources... that can promote or hinder industry growth and development” (Gereffi & Fernandez-Stark, 2016, p. 14).

Upgrading can occur in three different ways: economic, social and environmental. Of most relevance to this study is economic upgrading which refers to firms moving to higher value-adding activities. According to Humphrey and Schmitz (2002), economic upgrading can occur in four ways: product (production of more sophisticated product lines, for example, the premiumisation of vanilla), process (transferring inputs into outputs more efficiently), functional (firms acquire new functions along the chain, for

example branding), and chain upgrading (firms moving into related sectors). Bamber, Fernandez-Stark, Gereffi, and Guinn (2014), further identified other forms of upgrading, of which entry into the value chain is of most relevance to this study. Entry into the value chain is “where firms participate for the first time in national, regional or global value chains. This is the first and one of the most challenging upgrading trajectories” (Gereffi & Fernandez-Stark, 2016, p. 12).

A GVC approach is important as, by analysing the chain, “information is obtained that should lead to better decision making by both those involved in the chain (farmers, traders, etc.) and those wanting to support the value chain (policy makers, donors, etc.)” (McGregor & Stice, 2014, p. 5).

This research seeks to identify potential benefits, or otherwise, that can accrue to local vanilla farmers through incorporation into regional and global value chains. Specifically, the project seeks to understand the potential for the sector to be incorporated into regional and global value chains and, where it is occurring, the degree of local stakeholder involvement, how the value chain is governed, and to identify the wider social and economic benefits for sustainable development.



2.2 Inclusive Development

Being incorporated into GVCs has implications for inclusive development. It goes without saying that small-scale producers in developing countries face a number of constraints to being able to competitively participate in commercial value chains. Bamber and Fernandez-Stark (2012) identify four pillars for small-scale agricultural producers seeking to gain sustainable inclusion into commercial value chains, whether they be regional and/or global (see Figure 3):

Access to markets. Farmers do not necessarily have contacts with potential buyers and thus facilitation of connection between farmers and buyers is essential. Access to markets may include the education of buyer firms as to “the business potential of sourcing from small producers” (Bamber & Fernandez-Stark, 2012, p. 4). According to Bamber and Fernandez-Stark (2012, p. 7) “establishing an ongoing relationship between the producer and the buyer, is a critical factor in the inclusion of small producers in the value chain.”

Access to training. Specific training may be required in order to improve quality and productivity. For example, training is required to ensure compliance with certification requirements that govern access to markets. Other forms of training can include financial literacy, entrepreneurial, technical, and other skills.

Co-ordination and collaboration building. It is crucial that small-scale producers work together in order to compete internationally. Collaboration also facilitates the sharing of knowledge and the building of social capital and can reduce information asymmetries. Co-ordination and collaboration can include horizontal linkages (among producers in order to form, for example, producer groups, which in turn can lead to upgrading initiatives) as well as vertical linkages (between other value chain actors in order to establish linkages and improve the performance of the chain).

Access to finance. Investment is required in order to enter into a value chain, for example equipment and infrastructure costs. Small-scale farmers often lack credit facilities and/or the financial literacy needed to apply for loans. Credit constraints can mean that farmers are not able to invest in the equipment necessary for achieving productivity efficiencies.

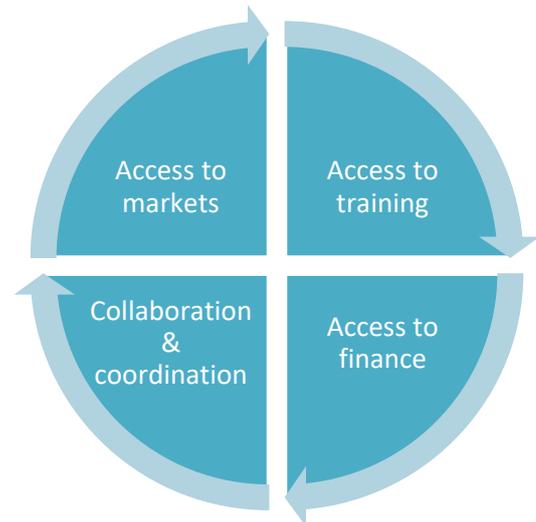
Bamber and Fernandez-Stark (2012) note that “every intervention should include [these four major pillars] to raise the competitiveness of smallholders in order to include them in a sustainable way in the national or international value chain” (p. 4).

While a number of studies (for example those commissioned by the World Bank, UNCTAD, USAID as well as national governments) have looked at how developing countries can increase their participation in GVCs, to date, little is understood about GVCs, their functions and implications for sustainable development in the Pacific, particularly in relation to the vanilla industry.

In the next section we provide an overview of the global vanilla industry in order to gain

more insight into the potential for a viable vanilla industry in the Pacific.

Figure 3 Four pillars for sustainable inclusion.



Source: Gereffi and Fernandez-Stark (2016).

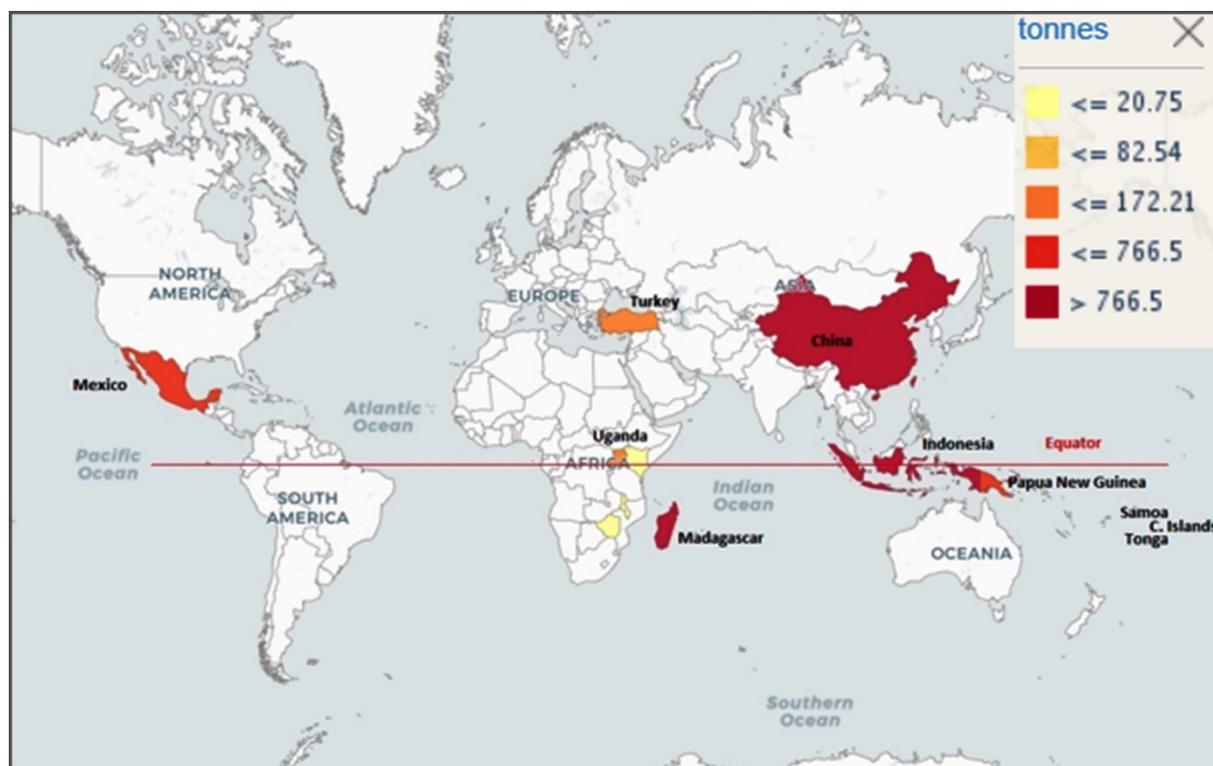
3. The Vanilla Industry: An Overview

3.1 Introduction

Natural vanilla, the succulent fruit of the vanilla orchid family, is the second most expensive spice after saffron. Growing vanilla is a labour-intensive process and it can take up to 3 to 5 years for plants to yield their first vanilla beans (AgriFarming, n.d.). Each flower of the orchid is hand pollinated, and flowering only occurs one day a year. A notable exception to hand pollination occurs in Mexico where flowers are pollinated by *Melipona* bees and hummingbirds. Vanilla is native to Mexico—the first people to cultivate the plant were the Totonacs on the east coast of Mexico around the 14th century.

Vanilla is grown in tropical climates; the ideal geographical locations being 20–25° north and south of the equator (see Figure 4). The Pacific Islands fall within this geographical band. In order to successfully grow vanilla, temperatures of between 20 to 30 °C are needed as well as annual rainfall from 2,000 to 3,000 mm, along with 50 to 70 % shade to maintain the microclimate for vanilla growth (Matenga, 2017a). The notable exception is Turkey, which falls outside of the ideal geographical band for growing vanilla.

Figure 4 Geographical band of vanilla production



Source: Generated and adapted from FAOSTAT, 2017.

3.2 Vanilla Species

There are three major vanilla plants commercially grown: *planifolia*, which originated from Mexico, *tahitensis*, originating from Tahiti, and *pompona*, which is grown in the West Indies and the Caribbean. Climate and soil nutrients make each of these varieties unique. In this report, we focus on *planifolia* and *tahitensis*, as these are the two most popular varieties, and both are grown in the Pacific Islands.

The *planifolia* variety, which is also known as Bourbon, is typically grown in Madagascar and other islands within the Indian Ocean (Comoros and Réunion). Bourbon was the common name given to the *planifolia* variety as it was a French slave from Réunion (Ile Bourbon) who identified how to pollinate the flowers by hand. Bourbon vanilla beans have a higher vanillin content and thus a very

strong vanilla flavour.¹ Vanilla beans grown in Madagascar and Mexico are very similar in flavour as they are from the same species, although different soil and weather conditions create diverse flavours. Bourbon vanilla makes up the largest market share of natural vanilla sold in the world and is the variety most commonly used in extracts (Rain, 2018).

In addition to being grown in Tahiti, *tahitensis* is also grown in Indonesia and several South Pacific countries. The Tahitian variety is generally thicker and shorter in length than the Bourbon beans. The beans also have a thinner skin and produce a fruitier and more floral aroma due to the lower content of vanillin than Bourbon (McGregor, 2004). Table 1 provides an overview of the key differences between the species.

Table 1 Bourbon and Tahitian species of vanilla.

Bourbon Vanilla (<i>planifolia</i>)	Tahitian Vanilla (<i>tahitensis</i>)
Larger commercial market share—Madagascar dominates production	Niche market share—mainly French Polynesia (Tahiti)
Higher vanillin content	Lower vanillin content
Longer period of curing	Shorter period of curing
Smokey and strong vanilla flavour. Strong and earthy aroma with a richer, more potent taste	Fruiter and more floral aroma. Subtle, fruity sweetness and unmatched floral properties
Narrower range of geographical locations to grow successfully	Suitable to a wider range of growing conditions

Sources: McGregor, 2004

¹ http://www.celkau.in/Crops/Spices/Vanilla/vanilla_composition_and_vanillin_content.aspx

3.3 The Vanilla Cultivation Process

The processing of vanilla is both a labour-intensive and time-consuming process (see Figures 5-7).

Figure 5 Pollinating the orchid flower.



Figure 6 Vanilla beans.



Very few natural pollinators exist. Each flower must be hand pollinated within 12 hours of opening. Hand pollination involves placing the male pollen onto the female

stigma, and closing the flower. If pollination is successful a pod appears in a few days.

Vanilla beans are ready to be harvested between 9 to 11 months after pollination (see Table 2 for the vanilla cultivation process). The pods are harvested by hand and then sorted by length and cleaned—at this point the beans may be sold to buyers as green beans. This stage is followed by drying and curing—an essential stage in order to bring out the aroma and flavour of the vanilla bean.

Several methods exist for curing vanilla; nevertheless, all methods consist of four basic steps: killing, sweating, slow-drying, and

Figure 7 Curing the vanilla beans.



conditioning the green beans. Curing is a vital stage in the vanilla cultivation process as it determines the quality of the final product. It is also a labour-intensive and time-consuming process.

Sophisticated and technologically advanced equipment such as dehumidifiers has reduced the time and labour required in the curing process. When cured properly, vanilla can be stored for an extended period of time.

Beans are then graded with a key factor in the grading process being the length of the bean. They are also graded according to vanillin and moisture content (Matenga, 2017b).

Table 2 The vanilla cultivation process.

1	Vines take between 3 to 4 years to mature. Where there are good-quality cuttings maturity can occur in 2 years.
2	Vanilla flowers open only one day a year.
3	Natural pollination occurs by [<i>Melipona</i>] bees and hummingbirds. However, to guarantee a greater percentage of pollinated flowers, manual pollination by hand with a small stick is necessary.
4	Approximately nine months after pollination the beans are hand-picked when perfectly ripe, in order to optimise their vanillin content.
5	The beans are dried in the sun for months to produce the aromatic spice.
6	Approximately 600 hand-pollinated blossoms yield about six kilos of green beans, which convert to one kilo of dried beans.

Source: *The Economist*, 2018

3.4 Key producing countries

Recent statistics indicate that the total global figure of harvested vanilla was 98,576 tonnes, and the total global amount of vanilla production was approximately 8,144 tonnes (FAOSTAT, 2017). According to FAOSTAT (2017), the top producing

countries are Madagascar, Indonesia, China, and Mexico. Interestingly, the strength of the smaller islands of the South Pacific, such as Papua New Guinea and Tonga, as established key actors of vanilla production, placed sixth and eighth respectively, does

indicate the emergence of potential strong contenders (about 9 % of the global production share) (See Table 3 and Figure 8).

Table 3 Global vanilla production 2017.

Country	Tonnes
Madagascar	3,227
Indonesia	2,402
China	662
Mexico	515
Papua New Guinea	499
Turkey	318
Uganda	214
Tonga	181
Other*	120

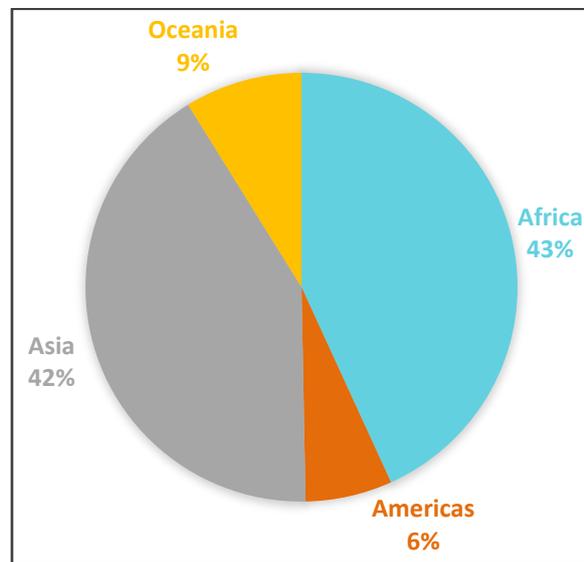
*Other countries include French Polynesia, Malawi, Réunion, Kenya, Comoros, Guadeloupe, Zimbabwe

Source: Generated from FAOSTAT, 2017

Over the last decade, in particular, market prices have been volatile. There has been an increase in demand from manufacturing firms including food and cosmetic companies. As a result, more farmers have planted

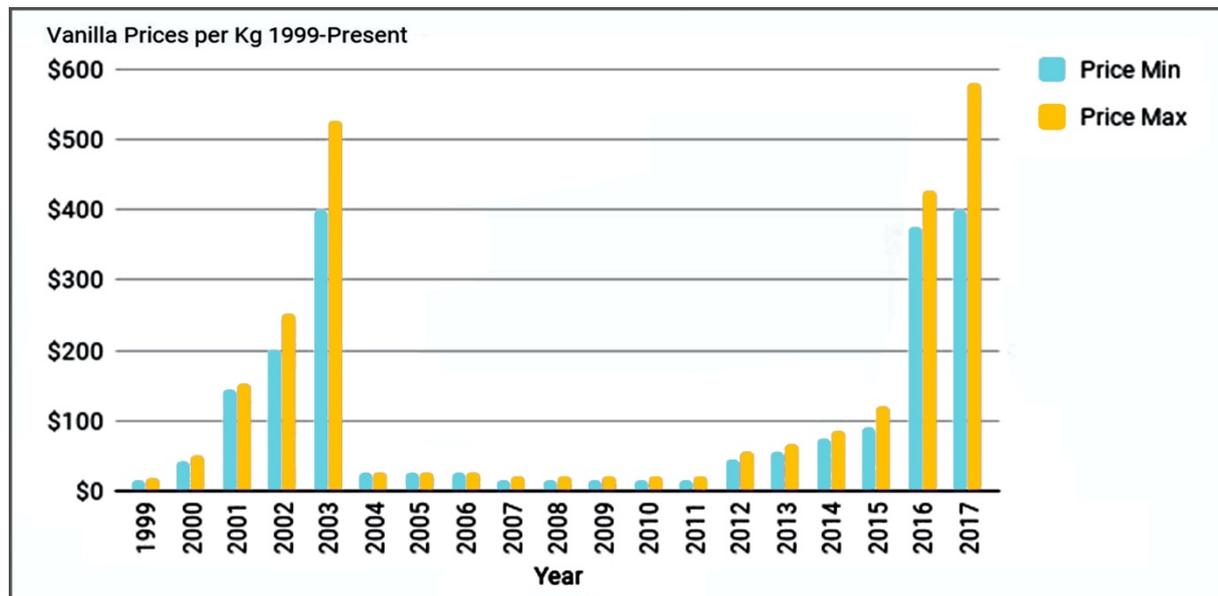
vanilla thus impacting on price. Price volatility has also arisen from significant crop losses from cyclones, drought and the early harvesting of immature beans. In 2015, the price of vanilla was US\$87.5 per kilo (see Figure 9). The world price for vanilla can be attributed to the scarcity of locations ideal for growing the orchid and the time needed for growth and maturity.

Figure 8 Production share of vanilla by region.



Source: Generated from FAOSTAT, 2017

Figure 9 World vanilla prices.



Source: Cook Flavoring, 2017

3.5 Demand for Natural Vanilla

Reportedly, less than 1% of vanilla flavour in products comes from natural vanilla (Bomgardner, 2016). Natural vanilla comes from the fruit of the flowering vanilla orchid. Artificial vanilla is synthesised from guaiacol, which is chemically derived from coal tar (Vanilco.com, 2018). Other substitutes that imitate vanilla flavours and scents also exist, among them pine bark, clove oil, chemical compounds, and even some waste residuals

from the wooden and paper industries (see Table 4 for a list of other vanilla alternatives)—which some might argue are natural (Bomgardner, 2016; Fenster, 2017; Michail, 2016). In 2001, Solvay, a Belgium chemical company, launched its Rhonvail natural vanilla produced from ferulic acid derived from rice bran through a fermentation process using a naturally occurring yeast (Watson, 2017).

Table 4 Vanilla flavours: synthetics and semisynthetics.

Vanilla flavours	Source
Vanilla bean	Natural vanilla containing vanillin glucoside
Rice bran fermentation	Solvay uses a naturally occurring yeast and ferulic acid to make its Rhovanil natural vanilla
Paper waste, wood	Vanillin can be made from lignin, wood (e.g., Borregaard in Norway using spruce tree lignin, coniferyl alcohol)
Clove oil	Vanillin was first synthesised and extracted from eugenol (found in clove oil) in 1874–75
Petroleum	Guaiacol: a substance extracted from a petroleum derivate
Cow dung	Japanese chemist Mayu Yamamoto created vanillin from cow dung
Baker’s yeast and sugar	Vanillin produced from fermenting sugars (e.g., corn sugar) with a genetically engineered baker’s yeast
Castoreum (aka Beaver’s Butt)	Secretions of a beaver’s castor sacs which are located near the anal glands

Source: Bomgardner, 2016.

According to Carol McBride (cited in Bomgardner, 2016), a manager from Symrise, one of the world’s leading manufacturers of flavours and fragrances, “the amount of all vanilla beans in the world is not sufficient to flavor everything that everyone wants to flavor with vanilla.” Pure natural vanilla is an extremely complex flavour and thus very hard to imitate (Anuradha, Shyamala, & Naidu, 2013).

Demand for natural vanilla is increasing with the addition of new markets (China being an example) and increased preference for

natural vanilla over synthetic vanilla. The main drivers behind the demand for natural vanilla are large international buying firms. For example, Coca Cola is responsible for purchasing approximately 200 tonnes of natural vanilla each year (Tomkins, cited in Krishnan et al., 2012). Other large buyers include ice cream, bakery products, and perfume manufacturers. In the United States, it is a requirement of the Food and Drug Administration that vanilla ice cream must be manufactured using natural vanilla. If this is not the case then manufacturers must label their ice cream “vanilla-flavoured” or “artificial

vanilla” which may deter consumers from purchasing vanilla ice cream.

Consumer preferences, tastes and values have changed with more people aware of purchasing goods that are aligned with personal values, for example, health, sustainability, traceability and ethical transparency. The switch to “green” is a contemporary view of buying and eating responsibly, and industries have responded by adopting more rigorous, globally accepted standards, and better products and value for money. As an example, in 2015, several giant food companies including Hershey’s, Kellogg’s, Unilever, Nestlé and General Foods, which together control about 80 % of the products on

supermarket shelves, announced they would include more natural ingredients in their products (e.g., natural vanilla instead of synthetic) (see Table 5). In February 2015, Nestlé was the first big brand to announce they would replace artificial flavours with natural ingredients in more than 250 chocolate products in the US by 2020 (Bomgardner, 2016) thereby putting pressure on competing brands to follow (Leffingwell cited in Bomgardner, 2016). The increase in demand for natural vanilla over synthetic substitutes, “squeezes the supply chain and raises prices for everyone” (Martinko, 2017). (See Table 5 for an overview of initiatives companies are undertaking).

Table 5 Global food giants overhauling iconic products to include natural ingredients from 2015.

Company	Vanilla
Nestlé	Eliminating artificial ingredients in more than 250 chocolate products (Europe and USA). For example, the chocolate bar CRUNCH will use natural vanilla flavour in place of artificial vanillin.
Hershey Co.	Replacing synthetic vanillin with natural vanilla in their chocolate confectionary including candies, chocolate bars and Kisses.
General Mills	Ice-cream Häagen-Daz uses highest quality natural Bourbon vanilla sourced from Madagascar rather than synthetic vanillin.
Kraft Heinz	Introduced Jell-O Simply Good, pudding mixes made with real ingredients such as ... vanilla bean ... as opposed to artificial flavours.
McDonalds Corporation	Phased replacement of artificial flavours in favour of real vanilla in ice cream.
Mars Danone Firmenich Prova	Banished all artificial colours and flavours such as synthetic vanilla from chocolate bars. Initiated “Livelihoods Fund for Family Farming” for vanilla farmers in Madagascar 2015. Aimed at increasing farmer’s food security and tripling their revenues while providing high-quality sustainable and fully traceable vanilla over a 10-year span.
Kellogg’s	2020 Global Sustainability Commitments include sourcing vanilla responsibly, focusing on improving farmer livelihoods and mapping their footprints. No longer using artificial vanillin.
Unilever	Breyers ice cream (Unilever) has launched a new initiative with the Rainforest Alliance to use only vanilla from sustainably farmed vanilla beans from Madagascar. No longer using artificial vanillin.

Source: Derived from Barrett, 2015; Macdonald, 2017; Schroeder, 2017; Unilever, 2015; Watrous, 2016.

3.6 Importing Countries

Global demand for vanilla has seen prices and quantities fluctuate widely as producers and purchasers compete for best quality and prices. As of 2016, world consumption was approximately 6,274 tonnes with the United States importing 1,609 tonnes (FAOSTAT, 2016). Other major vanilla importers include France, the Philippines, Germany, and Belgium. (See Table 6 which shows the top ten countries importing vanilla, by quantity).

Table 6 Top ten vanilla importing countries (2016).

Rank	Country	Imports (tonnes)
1	USA	1,609
2	France	891
3	Philippines	710
4	Germany	605
5	Belgium	263
6	Mauritius	258
7	Canada	252
8	India	242
9	United Kingdom	241
10	Saudi Arabia	196

Source: Generated from FAOSTAT, 2016

4. Overview of Vanilla in the Pacific

In this section, we provide a brief overview of the main vanilla producing countries in the Pacific with the exception of the Cook Islands, Niue and Samoa, which are addressed in more detail in the subsequent sections.

4.1 Fiji

The vanilla industry in Fiji Islands is in the early stages of development; crops are grown in an artisan way by several farmers. Only a small number of producers export vanilla beans—Spices of Fiji is one of the main exporters. The main markets for Fijian producers are Australia and New Zealand; however, the financial rewards are minimal. The main problem in Fiji is the instability of the industry, namely inconsistency among farmers. Very few farmers are fully dedicated to growing vanilla, and tend to switch to other crops depending on the market prices (Turagaiviu, 2012). This is despite the quality of Fijian vanilla matching international standards. New Zealand company Heilala Vanilla is assisting farmers and hopes to include vanilla from Fiji in their supply chain (see discussion on Tonga, Section 4.4) (Heilala Vanilla, 2019).

4.2 Papua New Guinea

Papua New Guinea does not specialise in a particular type of vanilla, growing both the Mexican variety and the Tahitian variety. Climatic and soil conditions in Papua New Guinea make varieties grown there unique. The government has been urged by local business people to only allow locals to produce and market vanilla “instead of middle people buying the beans from the streets of Maprik or anywhere else” (The National, 2014). The National (2014) also

mentioned how a new programme would help farmers grow, process, and sell the vanilla with support from the government, support that these farmers had never received. More recently, however, East Sepik governor Allan Bird expressed concern that there are also no regulations governing the industry and in particular the export of vanilla (The National, 2017). He is further of the opinion that, when prices are high, farmers will harvest their crops too early leading to low quality. Papua New Guinea has the potential to be a long-term supplier to European markets.

4.3 Solomon Islands

Traditional crops grown in the Solomon Islands include copra, cocoa, coffee, coconut oil, taro, sweet potato, yam, chilli, cardamom, pepper, turmeric, and ginger (AusAID, 2006). The vanilla industry began developing in the second half of the 1960s; the first plants were imported from Hawaii in 1965. At the time, vanilla was an experimental crop. However, in 2006, a specialist from Vanuatu found that farmers lacked agronomic and processing knowledge (AusAID, 2006). The government, in collaboration with other organisations, sought to strengthen the industry by educating farmers on the importance of vanilla in the international market (Pacific Island Report, 2007) and supporting farmers interested in growing vanilla with technical assistance. They sought to increase rural incomes, foster the vanilla exporting industry, and develop premium quality products. In contrast to elsewhere in the Pacific, Solomon Islands vanilla producers, at this point, focused on producing a premium quality vanilla rather than diversified product crops (RAMSI, 2007),

largely targeting the organic premium markets (Pacific Island Report, 2007).

4.4 Tonga

French adventurers introduced vanilla to Vava'u in Tonga in the early 1800s. During this time, vanilla grew wild in the forest before being introduced to urban households by Catholic missionaries in the 1900s. In the 1950s, King Taufa'ahau saw the economic benefits vanilla could bring to the country, and encouraged farmers and

school leavers to focus on growing vanilla. However, a lack of market access, financial support and natural disasters over the following decades hampered the development of the vanilla industry in Tonga.

Today, Tonga's vanilla industry is in the revival stage of development. Tonga specialises in producing the Mexican variety of vanilla (Fuavao, 2012). Heilala Vanilla, a New Zealand company, and the Australian company Queen Fine Foods dominate the vanilla exporting market in Tonga.

Box 1 *Heilala Vanilla*

Heilala Vanilla is a New Zealand family-owned business that began as an aid project after cyclone Waka in 2001 (Heilala Vanilla, n.d.). The company grew its own vanilla on land leased from a local family in Vava'u and cultivated its first crop in 2005. The vanilla beans are transported to its headquarters in Tauranga for processing and packaging. Heilala Vanilla products are sold both domestically and internationally in North America, Europe and Asia. Heilala Vanilla supplies local manufacturers including Lewis Road Creamery, Kapiti Cheese and 42 Below.

Over the last few years, Heilala Vanilla has been looking to source beans from neighbouring Pacific Islands such as the Cook Islands to ensure a constant supply chain. In 2013, the Heilala Vanilla Foundation was established to ensure the ongoing sustainability of its unique partnership with the community in Tonga.

Box 2 *Queen Fine Foods*

Queen Fine Foods is an Australian brand. The origins of the company date back to 1897 when pharmacist Edward Taylor created a range of extracts including vanilla. He and partner Mr. Colledge formed the Queen brand and the company was later purchased by the Himstedt family in 1978. In 2015 Queen Fine Foods became a subsidiary of Dr Oeteker Australia Pty Ltd.

The company sources its beans from Tonga where it has a relationship with farmers in Vava'u. It also sources beans from Papua New Guinea, and Madagascar. As one of its initiatives, Queen Fine Foods began educating, training and funding farmers in Tonga, in order to ensure the long-term sustainability of the industry. Its products are sold in Australia, New Zealand and Malaysia. Queen Fine Foods is FairTrade certified.

In 2013, the two major buyers were described as being in a “trans-Tasman war.” Queen Fine Foods was reported to have locked 257 local farmers into 5-year supply contracts, purchasing beans for T\$13 per kg (NZ\$8) (FAO, 2018). The company provided additional payments during the vanilla-harvesting season to assist with fencing material and trimming. This prompted Heilala Vanilla to offer local growers a much higher price (T\$25 per kg or NZ\$16) which instigated a “price war” amongst the two buyers (FAO, 2018). Queen Fine Foods responded with public service announcements threatening legal action against farmers who had originally signed contracts but had sold vanilla beans to Heilala Vanilla (Field, 2013). During this time, Queen Fine Foods sought assistance from FairTrade to help the contracted farmers better negotiate the contracts and aid the creation of the Vanilla Growers Association of Vava’u.

In recent years, some farmers have abandoned their vanilla plots due to the lack of ongoing financial support and training. As of 2017, the “war” was still ongoing. Queen Fine Foods Vanilla is said to have been disappointed at not receiving a return on its investment in Tonga (FAO, 2018).

4.5 Vanuatu

Vanilla is an important and significant industry for farmers in isolated areas in Vanuatu (McGregor & Stice, 2014). According to McGregor and Stice (2014), 300 households (mainly in isolated areas) supply Venui Vanilla, the only commercial processor and exporter in Vanuatu. Venui Vanilla began in 1987 with owner Piero Bianchessi spearheading sustainable food production in Vanuatu. Initially, growing vanilla was the main focus. After the first harvest in 1990, the focus shifted to vanilla curing and marketing. A facility was estab-

lished for processing small amounts of split beans into vanilla essence and paste. A key strength of Venui Vanilla lies in the extensive dedication to R&D on growing and developing organic vanilla. Bianchessi has a chemistry background that has been crucial to reaching world standards in premium and specialised markets. The company’s focus on sustainability, including fair trade, positions Venui Vanilla as a socially responsible enterprise (VanillaReview, 2008; Venui Vanilla, 2019).

Venui Vanilla received organic certification in 1997 throughASUREQuality NZ which is IFOAM (International Federation of Organic Agriculture Movements) accredited (FAO, 2014; Venui Vanilla, 2018). The company works as a group with the Farm Support Association of Vanuatu and production amounts to approximately 1,700 kg of vanilla per annum. In 2011, a typical farm plot for Venui farmers would have had 100–200 vanilla plants covering approximately 0.25 hectares (FAO, 2014).

Products were first sold locally, targeting the tourist market. Niche export markets were developed through participation in Fine Food NZ and Fine Food Australia trade fairs (Pacific Island Farmers Organisation Network [PIFON], n.d.). Venui Vanilla’s main export market in terms of value comprises three New Zealand ice cream companies. Japan is identified as the second largest export market, with Australia ranking third (FAO, 2014). The company continues to reward farmers by offering competitive prices and support to farmers involved with it. Certified products include vanilla beans, extract, paste and powder (Venui Vanilla, 2018). Venui Vanilla is important to the growth of the vanilla industry in the Pacific as it has produced a manual for vanilla growing that a number of growers in the region use (see Recommendation 1).

Venui Vanilla’s market is extensive, in recent years the company has not been able to cope with the international market demand.

Therefore, Venui Vanilla acquires vanilla crops from other producers in Vanuatu. In doing so, Venui Vanilla acts as coach providing technical support to all the producers involved with the company. Venui Vanilla acts as a knowledge source—knowledge is transferred to other producers, to build up a network of producers who are experts in growing organic vanilla.

We now go onto to discuss the three case study countries, Cook Islands, Niue and Samoa that form the basis of this research.

Before discussing each country individually, we provide a timeline of the development of the vanilla industry in each country (Table 7; see also Appendix 2 for a global timeline). Each country is at the nascent stage of development, with the respective governments undertaking initiatives to encourage farmers to grow vanilla.

Table 7 Historical timeline of vanilla events in the three South Pacific countries.

Year	Cook Islands	Niue	Samoa
1940s	1942—Tahitian vanilla (<i>tahitensis</i>) introduced to the Cook Islands (Matenga, 2017).		
1950s			
1960s	1961—Vanilla production of 2 tonnes recorded (FAOSTAT, 2019).	Farmers keen to grow vanilla but initiatives fail due to a number of constraints.	
1970s			
1980s	Land ownership hampers the rejuvenation of the vanilla sector. Smallholder farmers consider forming a co-operative; however, they lack legal advice and specialist knowledge on how to grow vanilla. Research unit set up to investigate how different vanilla varieties grow in the tropics.	Farmers again keen to grow vanilla.	
1990s			
2000		Vanilla promoted as a potential export crop but, according to Murray (2000), neither vanilla nor nonu have “ever generated significant export income and nor have they generated adequate productive employment, hence the extent of emigration from Niue.” (pg. 213).	
2001			
2002		Niuean government begins to work closely with NZ government to develop the vanilla sector.	

Year	Cook Islands	Niue	Samoa
2003			
2004		Niue Department of Agriculture, Forestry and Fisheries (DAFF), with support from NZODA, starts supporting vanilla farmers in spite of the limited workforce and lack of skills. Cyclone Heta decimates the support trees used for vanilla planting.	
2005			
2006		Local farmers grow vanilla on their own farms and around their homes.	National Organic Advisory Committee established by a government directive to support and promote the development of organic farming in Samoa.
2007	Pacific Island countries begin to understand the benefit of “high-value” agricultural products. The need to pass quarantine restrictions is a major obstacle.		Organic certified virgin coconut oil from Samoa exported to The Body Shop International in the UK with the assistance of WIBDI.
2008			Vanilla interest begins with at least 60 vanilla farmers assisted through WIBDI. Vaoala Vanilla established.
2009	Discussions begin (with agriculture and finance ministries) to assist potential vanilla growers in Titikaveka.		
2010	Locals in Atiu optimistic about recent agricultural schemes promoting the growing of vanilla and pineapples.		Vaoala Vanilla organically certified (NASAA).
2011	The Ministry of Agriculture (MoA) launches a pilot project to revitalise vanilla farming. About 20 individuals begin to grow vanilla with funding from the government but only four continue as serious farmers using shade houses.		
2012	Aituan vanilla priced at NZ\$50 per bag. Vanilla growers travel to Tahiti to learn more about growing vanilla. Growers introduced to shade houses and encouraged to use for cultivating vanilla.	Niuean beans have a high-quality reputation but insufficient beans are produced to meet demand. Former growers are reluctant to start planting vanilla again as when they were in full production, no one was buying.	WIBDI workshop in Upolu to teach farmers about hot water curing—a necessary step for vanilla production.

Year	Cook Islands	Niue	Samoa
2013	MoA applies for funding from China: NZ \$1.5million to buy 100 shade houses, machinery and other resources for vanilla plantation.		STEC proposes vanilla as Samoa's next viable agricultural export; plan to establish ten acres at Mulifanua for a vanilla plantation.
2014	Vanilla workshop run by Tahitian vanilla farmers in Rarotonga. Discussion about forming a "co-operative enterprise" to centralise the drying and processing of vanilla beans. Local growers urged to form co-operatives as this is "their best chance of building a successful export brand." BTIB develop a quality standard to produce premium brands of vanilla.		
2015	Heilala Vanilla assisting the Cook Island vanilla growers and hoping to include them in their future supply chain. Government focuses on local production and new niche products (e.g., vanilla).		
2016	Government allocates NZ\$150,000 as a "soft" loan (CIG Vanilla Business Support Fund) for farmers. However, no farmers apply for the loan. Business Trade Investment Board (BTIC) holds a meeting to discuss revised loan criteria and application processes with interested vanilla growers. Local growers do not apply for the soft loans offered by the government. Teariki Matenga (MoA) believes that criteria attached to the funds may be the reason why. FAO and MoA began a project to help local farmers and processors produce more nutritious and safe foods for the local market. First training held for the production and postharvest processing of the vanilla beans in Mangaia. Progress report released on the construction of demonstration shade houses.	NIUE Vanilla is the first Pacific Island food product to be stocked in all 32 stores of Trade Aid in New Zealand. All six lines of products will be sold, potentially around NZ.	MPMC, MCIL and STEC take charge of vanilla export drive as the Vanilla Governance Committee (VGC). Ross and Diane Appleton of Equagold lend their expertise to boost the vanilla drive and revitalise the vanilla industry in Samoa. Government assists Samoa's "best" local vanilla farmer. Faiumu Faimafili Notoa (now deceased) receives a government "lifeline" to improve farming and training.
2017			The Samoan government seeks to encourage vanilla plantations as aligned with the Strategy for the Development of Samoa (SDS) (2016/17—2019/20).

5. Vanilla in the Cook Islands

The potential for the development of the vanilla sector in the Cook Islands is such that the past agricultural minister, Kiriau Turepu, believes that vanilla “is the only thing that we have a fairly good chance of in the world market” (Chapman-Smith, 2013).

5.1 Development Constraints

In 2016, the total population was 17,459; a decrease of 2 % in comparison to the population at the time of the 2011 census (van Leeuwen, 2018). While local citizens do not experience poverty to the same extent as other nearby Pacific nations, there are variances in wealth between the villages from Rarotonga and the outer islanders.

Like other Pacific nations, the Cook Islands suffers from development constraints such as geographical isolation and remoteness. Despite the recent surge in numbers of tourists, the economic base is narrow and vulnerable to shifts in tourist preferences to competing markets, or economic slowdowns that may occur in New Zealand or Australia (Cook Island Government, 2015).

Labour force participation is relatively high in the Cook Islands. In the 2011 census, approximately 37 % of the employed population (over 15 years) was working in the tourism sector (retail, trade, restaurants and accommodation) while 4.4 % stated they were employed in agriculture, forestry and fishing. The domestic market for agricultural products is small and transportation costs are high. Trade deficits are off-set by diasporic remittances and by foreign aid. Total imports continue to increase while total exports decline. To put this into perspective, about 83 % of the Cook Islands’ daily food intake is imported.

The tourism sector presents the greatest potential for the growth of the agricultural sector through agri-tourism. Vanilla could play a key role in this. To promote the linkages between agri-food and the tourism industry, the government recently held an agri-tourism policy-setting workshop. This highlights a proactive push from government to promote their agricultural products through their tourism industry.

5.2 The Agricultural Landscape

Agriculture is the most common secondary income for urban households. According to the 2011 census, agriculture accounts for 1.6 % of the total income per household in Rarotonga (Cook Island Government, 2011). In rural areas (outer islands and rural Rarotonga), agriculture continues to be a vital revenue stream and form of sustenance.

Before the 1970s, the Cook Islands was an agricultural economy with pawpaw as the main export product. In the 1980s, cultivation of Black Pearls began in Manihiki, to supply the export market. Other main agricultural export crops include noni (organic), pawpaw, maire, chilli, and taro. More than half of Cook Island households are engaged in agriculture, and more than two-thirds use agriculture for subsistence living. Outmigration and an aging farmer population, coupled with natural disasters and the scarcity of arable land, have negatively contributed to this situation.

Cook Islanders follow Ra’ui which is a traditional practice of enforced customary prohibition imposed by Ariki (chiefs) over certain uses of land and sea for a set period of time to allow for the replenishment of stock. Although there are 2029 acres of

identified agricultural land, more than one-third is sandy clay-type soil, or under bush (Ministry of Agriculture, 2015).

There is considerable potential for increased local agricultural production (for example coconuts, tropical fruit, honey production) (Cook Islands Government, 2015). However, there are numerous constraints that limit further growth, for example, substandard biosecurity treatment facilities for international market access and compliance to an importing country's quarantine requirements; labour shortages; high fuel costs; low water supply; and co-ordination failures in supply chains (Ministry Budget Statements, 2017).

In 2016 and 2017, the government invested in vanilla production with the goal of long-term growth and a broadening of the agricultural sector. Anticipated deliverables of the government investment included eight vanilla shade houses and plantations, which are expected to produce beans in 2019.

5.3 The Vanilla Industry

The Tahitian variety of vanilla was introduced into the Cook Islands in 1942 in an effort to establish the crop as a commercially viable product (Matenga, 2017a) (see Table 7 for a timeline). Nevertheless, the development of the industry failed due to a lack of access to markets, internal transportation costs, and lack of farm management skills. Moreover, propagation never took off in the islands of Mauke, Aitutaki and Atiu.

In the mid-1980s issues concerning land ownership and difficulties in formalising an organising structure for smallholder farmers hampered the rejuvenation of the vanilla industry. The smallholder farmers involved considered establishing a co-operative. However, they lacked legal advice and specialist knowledge of how to grow and

maintain vanilla. In 1989, a research unit was set up to investigate how different vanilla varieties grow in the tropics, resulting in two different vanilla varieties being planted, the Mexican and Tahitian varieties, on the south side of the islands.

In 2012, the Ministry of Agriculture sent a cohort of farmers and government delegates to Tahiti to learn of their agricultural systems. The team included then Minister of Agriculture, Kiriau Turepu. One of the key findings from the trip to Tahiti was the effective use of shade houses to grow vanilla. Mission delegates were intrigued with the ease and speed at which vanilla grew in shade houses. As a result of the mission, four farmers began growing vanilla, using shade houses rather than planting vanilla on land with the vine supported on trees. While shade houses are not a requirement to grow vanilla, they are beneficial in that they help to control the environment and growers don't need to use pesticides or artificial fertilisers. Figure 10 shows a newly built shade house in Rarotonga.

Figure 10 Vanilla shade house.



As an outcome of the vanilla expedition, in 2012 the Business Trade and Investment Board (BTIB) assisted the Ministry of Agriculture and Fisheries (MAFF) to deliver the “Vanilla Business Support Fund.” The initiative was set up to focus on diversifying export commodities with a particular focus on vanilla. Soft loans and incentives were given to those interested in growing vanilla. Initially, 20 vanilla farmers received government funding but only four continued farming vanilla.

The finances provided through the soft loans were to assist farmers with costs related to shade-house and fencing materials. However, during the implementation of the programme, a number of ministry workers and farmers were suspicious of a former agricultural minister’s agenda in the vanilla programme as it was suggested he was using the programme to develop his own vanilla operations.

In order to try and further develop the industry, in 2013, the Ministry of Agriculture applied for funding from China for an estimated NZ\$1.5 million to purchase 100 shade houses, machinery and other resources for vanilla planting. Little is known about the result of this funding application.

Further initiatives in 2014 saw vanilla farmers from Tahiti brought in to provide training and workshops for local farmers. Owners of the Tahitian company Hotu Vanilla, Guy and Odette Tauatiti, delivered a 4-day programme that included hands-on training in vanilla plantations, followed by teaching sessions back at the Ministry of Agriculture headquarters. Discussions regarding the formation of a co-operative structure were found to be fruitful. As a result, local vanilla growers were advised by civil servants and consultants to form a co-operative to help build a strong export brand.

However, to date, the government and farmers have done little to initiate or coordinate a co-operative structure. Some participants suggest that farmers are reluctant to form a co-operative because there is little understanding as to what a “co-operative” constitutes. This point is reiterated in concerns farmers have as to who holds the authority in a co-operative situation. One participant proposed the idea of centralising the drying and value-added processes, for quality-control purposes, through a co-operative.

In 2016, the Cook Island government implemented their “National Sustainable Development Plan (2016-2020)” aimed at guiding the nation with specific sustainable development strategies that included promoting sustainable land use. Part of this plan recognised high-value niche crops (e.g., vanilla) that could assist with transitioning the Cook Islands from their heavy reliance on imports (fresh fruit and vegetables) to locally made produce with export potential. Given that tourism is the backbone of the economic sector, agriculture could support and feed the nation and tourist industry which, in turn, boosts economic development.

Having recognised the importance of vanilla as a viable agriculture crop, in 2016 the government agreed to revitalise the previously failed vanilla industry. The price of vanilla increased as the demand outweighed the supply due to civil unrest in Madagascar. The government approved the allocation of funding of NZ\$150,000 for eight shade houses, and set up a fund to support farmers, offering soft loans of up to NZ\$20,000 to set up vanilla operations. The Ministry of Agriculture was to provide technical guidance through extension services and marketing strategies.

However, no farmers applied for a loan. A key informant believed that there were issues

around the process of applying for the funds, the “issue may have been that growers did not understand the criteria.” Other participants in this study mentioned that farmers did not understand the commitment and investment (time and finance) required to get vanilla plantations off the ground. One participant discussed the lack of communication and disclosure from the Ministry of Agriculture in relation to the eligibility criteria, which prevented farmers in applying for the agricultural loans.

A key informant stated that as part of the development of the industry, the Ministry of Agriculture is trying to get growers to switch from the Tahitian variety, which has more of a niche market, to the Mexican variety, which is more fruitful and easier to find an export market for. Some farmers are still growing the Tahitian variety as they have already put a lot of work into setting up shade-houses. Shade-houses, although not essential for successful growth, are mostly used to harvest the Tahitian variety, incurring additional material costs and maintenance. The establishment costs per shade house are estimated at NZ\$20,000 with an additional NZ\$5,000 to freight the materials to outer island vanilla producers (Matenga, 2017b).

5.3.1 The vanilla industry today

Rarotonga vanilla sector

There are eight vanilla nurseries in Rarotonga; however, the plants have yet to produce beans. The growers highlighted their strategy of focusing on developing a sustainable supply of vanilla for the local market before trying to export. There is potential in strengthening value-added processes in the Cook Islands. One key buyer in Rarotonga is currently purchasing green vanilla beans from individual farmers

for wine flavouring, perfumes, oils and extracts. See Table 8 for an overview of vanilla activities and actors.

Two of the three main growers own the more established vanilla operations in Rarotonga. One grower is an experienced farmer and cultivates various root crops and fruit such as watermelon and dragon fruit. The other grower started his plantation by taking advantage of the Vanilla Business Support Fund through the BTIB and MAFF. With his grace period (the period in which repayment of the loan can be made without penalty) about to expire, the farmer is concerned about being able to harvest and get his beans to the market. This concern and the related stress were also highlighted by his family. To combat the presence of slugs and ants, one farmer is experimenting with different eradication techniques. Participants also talked about having poor irrigation systems, which they believe have affected the growing patterns of their vanilla.

A local vanilla specialist noted that the recent publicity on vanilla in the Pacific has resulted in a resurgence of interest from growers and exporters alike. However, growers lack the patience and enthusiasm to carry on cultivating the labour-intensive crop. Figure 11 shows an abandoned vanilla plot.

5.3.2 Outer island vanilla plantations: Mangaia

Like many other outer islands, Mangaia faces a number of development challenges such as high outmigration and geographic isolation. It does, however, have the ideal climatic conditions for growing vanilla. When cured, vanilla is a non-perishable high-value crop which makes it particularly attractive for farmers in remote locations

Table 8 Cook Islands Vanilla Activities and Actors.

	BTIB	MAFF	Te Winery	Farmer
Vanilla Input Supply				
Finance Vanilla farmers need capital and financial resources to purchase irrigation equipment, machinery and shade-house materials and construction.	✓	✓		
Seedling Supply Vanilla seedlings are sourced from the forest and local bush area where vanilla grows wild.		✓		✓
Available Land A quarter acre is sufficient for small family plantation.	✓	✓		✓
Equipment Equipment includes mulching machinery, tools for pruning and weeding, an irrigation or watering system, and facilities for sorting, curing and processing vanilla beans.	✓	✓		
Production				
Planting and Land Management Vanilla plants require shade, high humidity, and a support system to anchor and loop the vines. Cook Island farmers use the Kāpaiē (Panax), Ficus (fig trees), Gliricidia and Kaute 'Enea (hibiscus trees).		✓		✓
Harvesting				
Vanilla beans are ready to harvest 9 to 11 months after pollination. The beans are washed, dried, wrapped and left to ripen. This process usually takes 5–7 days.		✓		✓
Cured beans are graded according to length, appearance, vanillin and moisture content. The length of the beans constitutes the key difference between grades.				✓
Value-Added Processes				
Vanilla beans (ripe and cured) are sold to local entrepreneur for value-added processing.			✓	
Sales and Marketing				
This research could not substantiate claims of vanilla sales within the Cook Islands.			✓	

such as Mangaia. It is said that a Tahitian visitor, a close acquaintance of a local church minister, initiated vanilla cultivation for market use in the early 1950s. He saw that vanilla was growing wild in the forest and took the time to train locals on how to cultivate vanilla (including managing plantations and the pollination process). When his wife passed away, he left the island which resulted in a lack of capacity. Further, farmers felt they did not have anyone to

encourage and assist them. A number of participants emphasised the need for constant training and incentives to encourage farmers to sustain their plantations. In 2016, it was reported that there were six active vanilla growers on Mangaia (Matenga, 2016). In 2018, there is only one active farmer. Reportedly, the growers abandoned their vanilla plots due to the lack of financial and technical support from the government.

Figure 11 Abandoned vanilla plot.



The remaining farmer supplies Te Winery Extractors and Distillery with green beans

for value-added products on the main island of Rarotonga. Although the farmer is no longer in full production, he is still very passionate about growing vanilla and, given the opportunity, is keen to get back into full production. He acknowledges that market demand is the driver for him to grow vanilla on a full-time basis.

Roaming animals were identified as a significant challenge for farmers in Mangaia. Farmers saw the construction of fencing and shade houses as a way to protect their crops; however, materials are expensive and often difficult to source. A number of participants in Mangaia shared their concerns and disappointment with the allocation of the vanilla project funds. Numerous farmers were promised shade houses but had never received materials or communications from the government.

5.5 Key Actors in the Vanilla Industry

Ministry of Agriculture

The Ministry of Agriculture is responsible for the development and policy formulation of agricultural production in the Cook Islands. This includes research and development for crop and tree species and improved agricultural production methods, including livestock. The Ministry also has responsibilities in the area of biosecurity and has a specific division dedicated to enforcing regulations related to biosecurity issues. Key informants emphasised the role of the past agricultural minister, Kiriau Turepu, in re-introducing vanilla to local farmers. The Ministry has been a significant actor in providing technical expertise and financial support to vanilla farmers.

Business Trade and Investment Board (BTIB)

In 2012, BTIB, together with the Ministry of Agriculture and Fisheries, introduced an initiative focusing on diversifying and increasing export of agricultural products with a specific focus on vanilla (see Box 3 for more information). The initiative included providing incentives via soft loans and delayed repayment schemes to provide farmers with support during the non-productive early stages of vanilla cultivation. It was envisioned that harvest would eventuate in the third year, hence the justification for delayed loan repayment, with the total debt retired in the fifth year.

During the cultivation period, Ministry of Agriculture workers were expected to provide technical support and assistance to assure the long-term sustainability of the vanilla industry. Farmers reported that there was a lack of technical support, poor extension

support from the Ministry and few incentives to encourage farmers to sustain vanilla production. Initially, 20 vanilla farmers received government funding to assist with developing their vanilla operations but only four continued vanilla planting.

Box 3 Business Trade and Investment Board (BTIB)

The BTIB is a government-funded agency that provides funding and training for business development. BTIB provides low-interest loans, market guidance and information, technical support and business mentoring. The BTIB is helping to develop Cook Island product brands and position them in a premium niche market.

Agency objectives:

1. Encourage and facilitate the participation of Cook Islands in investment and in the ownership, management and control of investment and business.
2. Promote, co-ordinate and facilitate trade to, from and within the Cook Islands.
3. Promote, foster and assist the establishment of investment in the Cook Islands.
4. Regulate, monitor and control the direction of foreign investment in the Cook Islands.

The central government allocated NZ\$550,000 to be distributed via soft loans to assist new and existing businesses. BTIB has previously worked with the Bank of Cook Islands and MAFF to provide small stimulus loans (up to NZ\$3,000 at 5 % interest, payable within 12 months) to 31 farmers. According to evaluation documents, BTIB and the Bank of Cook Islands received full repayment on 80 % of the loans, despite the limited period. In 2016, BTIB dedicated NZ\$150,000 to boost vanilla farming in Rarotonga. The funds assisted with constructing vanilla shade houses for local growers.

Te Winery Extractors and Distillery

Te Winery Extractors and Distillers is a locally owned company that produces gourmet wines, liqueurs and vodkas. Each of these products is prepared from the fermentation of local fruits. The company is situated in Rarotonga where it processes its products to supply the local market. Te Winery Extractors

and Distillers purchases vanilla from local growers for wine flavouring, perfume and other value-added products. In 2015, owner/operator Framheim Koteka was a delegate to the Pacific Trade and Investment Small Island Developing States Trade Mission.

5.6 Summary

The scale of vanilla production in the Cook Islands is an issue given the high set-up costs involved through the use of shade houses (although it must be noted that shade houses are not necessary to grow vanilla), the long lead-time for financial return on investment, and the laborious process of hand pollination. There is potential for the vanilla sector to grow in the Cook Islands, and there have been numerous attempts to promote and encourage the development of the industry. The established tourism and service industry

provides a gateway to market for local farmers. A continued commitment from the government, investing in extension services to train farmers, and strengthening the relationship between local growers and the private sector, is required to develop the vanilla sector in the Cook Islands.

In summary, there is potential for the development of the vanilla sector in the Cook Islands, despite the constraints that farmers and the government face.

6. Vanilla in Niue

Currently, there are an estimated ten vanilla farmers in Niue with only two operations currently exporting, largely to New Zealand and Australia. NIUE Vanilla International, the key exporter, is gaining brand recognition both for itself as well as for Niue as a vanilla producing country. The second exporter operates on a small scale. Nevertheless, vanilla from Niue is gaining a reputation for being a quality product.

6.1 Development Constraints

Niue, the smallest state in the world, became self-governing in free association with New Zealand in 1974. Niue has a very small economy, and is one of the most aid-dependent countries in the world (Ministry of Foreign Affairs, 2015). Niue remains a highly fragile economy that faces many constraints including a small population, labour constraints, expensive and limited transport options, poor land quality, and exposure to natural disasters. Although Niue has unique problems, depopulation continues to be of particular concern since it tends to exacerbate many of the key constraints outlined above.

Emigration is one of the most significant development issues for Niue. Extensive out-migration since the early 1970s has had a negative effect on the labour force. The tourism and agriculture sectors have suffered the most with limited skilled workers available. The labour force participation rate is high at 68.6 % (Government of Niue, 2012). Twenty percent of the work force earn less than NZ\$10,000 annually and almost half (45 %) earn between NZ\$10,000 and NZ\$20,000. The remaining 30 % earn more than NZ\$20,000 (Government of Niue, 2012).

6.2 Agricultural Landscape in Niue

Agriculture is a very important aspect of Niuean culture, lifestyle and economy. While subsistence farming forms the basis of agricultural activity in Niue, commercial agriculture has played a significant role in the development agenda for the government in the past 2 decades (DAFF, 2014). In the past, the government has focused on root crops such as taro, yams and cassava as forms of development (DAFF, 2014). There was also a period when passionfruit was a commercial crop but this is a very labour-intensive crop, requiring hand pollination in the case of Niue. Despite being small, commercial agriculture still has potential to offer good returns on investment. Vanilla has emerged as a non-traditional cash crop that could provide significant returns for local farmers.

In the 1970s, copra, passion fruit, and limes were the main cash crops. However, a combination of labour shortages and natural disasters (cyclones and droughts) destroyed these crops, while changing prices for copra limited Niue's ability to supply overseas markets (Niue Company Laws and Regulations Handbook, 2013). In the 1980s, the three main exports were taro, green coconuts and zucchinis to New Zealand. Taro dominated the export market to New Zealand in the 1990s; the quality of Niue's taro is so good that even American Samoa became a major importer of this root crop in the late 1990s (Niue Company Laws and Regulations Handbook, 2013). A challenge facing Niue's agricultural sector is the limited availability of arable land, which is estimated to be around 204 square kilometres (Government of Niue, 2012).

6.3 Introduction of Vanilla

It is unknown when vanilla was first introduced to Niue (see Table 7 for a timeline). Key actors involved in the industry have suggested that it was introduced by missionaries or alternatively brought back by forefathers on exploration journeys.

Vanilla has grown wild in Niue for a long time. In the 1960s and 1970s, local farmers were keen to develop the vanilla industry as they could see it being a viable revenue stream. However, government priorities and policies did not facilitate this, due to “financial constraints and political issues” (Lee & Francis, 2009). By the 1980s, the government began to seriously consider vanilla as a crop to be grown. This shift in focus meant that the government began to provide material and funding support. The government encouraged families to grow vanilla for its health benefits. While the direct health benefits are questionable, the proactive support from government did encourage families to grow vanilla.

During the 1980s, Niuean farmers began to establish small plots around their homes. The development of the industry was further strengthened by a NZAID project administered by DAFF. The project aimed at enhancing vanilla production and promoting organic farming practices. Niuean farmers established an organic vanilla growers’ network to support the development of the industry and, in 2002, organic farming practices were formalised and certified through the Niue Organic Farmers Association (NIOFA) (refer Box 4 for more information).

During the 1990s, the government continued to focus their efforts on vanilla and noni as key drivers of economic development. DAFF was the focal ministry dealing with

seedling supplies, providing technical expertise and engaging in capacity building with farmers at this time. Local farmers were attracted to the financial gains and proactive government support and thus poured all of their efforts into cultivating vanilla. To ensure the production of quality vanilla beans, DAFF brought in vanilla experts from around the Pacific region to train and develop the capacity of local farmers. However, farmers were overly ambitious and planted vanilla in large areas. A majority of these big areas were difficult to maintain. Further, low vanilla production, a lack of external market access, limited financial resources and little immediate returns to farmers hindered the development of the vanilla industry.

There was a renewed interest in growing vanilla for export in the early 2000s. In 2003, the Minister for Planning and Economic Development, Bill Motufoou, was sent to French Polynesia to research vanilla cultivation methods and practices. The following year, a Tahitian leader encouraged the Premier at the time, Young Vivian, to look at increasing vanilla production (Pacific Islands Report, 2003). As a result, agricultural experts and vanilla farmers travelled to Tahiti in order to gain a greater insight into the industry with particular focus on land and soil conditions as well as the healthy planting of vanilla using shade houses.

In 2003, the government made a commitment to develop and expand vanilla production with the support of NZ\$175,000 in funding from NZAID (Pacific Islands Countries Trade Strategies and Agreements Handbook, 2016). The objective of the project was to expand the vanilla and noni industries through the establishment of private plantations based on organic farming principles (Nemaia, 2006). Little documentation is available regarding the outcome of the

vanilla project. Three years later, in 2006, vanilla planting began on the government’s demonstration plot.

The FAO, in 2007, funded an agro-processing facility to encourage and enable farmers to process agricultural products for export markets. Under the Technical Cooperation Program (TCP) for FAO, NZ\$30,000 was spent on constructing a small processing kitchen. The experimental kitchen included a small food product area and a processing unit with processing equipment provided (FAO, 2015). According to participants, no vanilla growers have used the processing facility. Informants suggested that additional tools and appliances were required for the vanilla value-added process.

6.4 The Vanilla Industry Today

Today, Niue’s vanilla sector is in a nascent stage of development. There are currently around 10 vanilla farmers, with two exporting product on a very small scale to New Zealand and Australia. According to civil servants, there are approximately 50 plantations scattered across Niue; however, the majority are abandoned. DAFF played a significant role in administering agricultural funding for vanilla harvesting, providing seedlings, training, resources and materials (see Table 9 for more information). However, participants noted the lack of extension services provided by DAFF. Agricultural extension services are central to food security, knowledge transfer and the overall sustainability of agricultural productivity. Extension services come in the form of DAFF civil servants visiting vanilla plantations to monitor plant growth (record harvest), train farmers and assist in maintenance when needed. According to one key actor, over the years farmers have often requested the assistance

of extension officers for mulching and cleaning but their requests have often been ignored. This has been due to labour shortages in DAFF.

The government owns one of the most productive vanilla farms, which is situated on their demonstration plot in Alofi. A total of eight full-time staff work on the demonstration plot where they also cultivate dragon fruit and root crops. The government sells its vanilla harvest to NIUE Vanilla International (see Box 5). Figure 12 illustrates the government plot.

Figure 12 A government plot.



The government has recognised the constraints to growing the agricultural sector. The “Niue Agriculture Sector Plan 2015–2019” was formulated to guide a coordinated approach to addressing the challenges faced by the agricultural sector. More specifically, the document highlights the government’s recognition of the limited vanilla supply, and

access to export markets, as key challenges to growing the vanilla sector (DAFF, 2015). In addition, DAFF pledged to provide assistance to strengthen marketing opportunities for certified organic products, particularly for vanilla.

In 2008, 38 farmers and two exporters were organically certified (Mapusua & Maccari, 2007). This number has steadily grown over the last couple of years with a group certification for 48 farmers. However, only five are active in the field today. A key informant attributes this decline in organic farming activity to the time-consuming nature of certification and costs associated with obtaining certification. Moreover, farmers are often discouraged to continue with organic farming practices as the returns are not as great as the input (time, effort, cost of certification).

In 2016, NIUE Vanilla International's vanilla became the first Pacific Island food product to be stocked in Trade Aid stores in

New Zealand. This shows the potential for Niue vanilla and also wider South Pacific vanilla such as from the Cook Islands, Tonga and Samoa. A number of participants highlighted how "Stanley put Niue vanilla on the map" and that increasingly vanilla beans from Niue are recognised as being of high quality. However, not enough beans are produced to meet demand; in the past, farmers have been cautious about growing vanilla as they were concerned about the lack of buyers.

The lack of capital, experience and technical capabilities within the private sector make it difficult for the agriculture and food industries to further develop and diversify. In addition, the limited labour available hampers the development of the private sector. To mitigate the labour shortage, it was reported by others that NIUE Vanilla International is bringing in migrant workers from the Philippines and India.

6.5 Key Actors in the Vanilla Industry

Department of Agriculture, Forestry and Fisheries (DAFF)

DAFF is a division of Niue's Ministry of Natural Resources alongside the Department of Environment and Department of Meteorological Services. DAFF provides technical services by way of vanilla training schemes, assistance with mulching and cleaning on vanilla plantations, and processing and grading vanilla beans. DAFF owns and operates the most established and productive vanilla plantations on Niue.

Koefaga Vanilla

In comparison to NIUE Vanilla International, Koefaga's operations are small.

Koefaga Vanilla is a locally owned company. The owner/operator cultivates her own vanilla and purchases green beans and cured beans from other smallholder farmers. The Koefaga Vanilla range is sold locally and via international orders. The product range includes vanilla extracts and beans.

Niue Island Organic Farmers Association

As noted above, NIOFA was established in the early 2000s with support from NZAID. It focuses on production, certification and marketing of agricultural products with support from local government agencies such as DAFF. A founding member of

NIOFA, Mrs Rauru Vakaafi was a keen vanilla grower. Her sudden death in 2004 contributed to the decline in the vanilla industry. Today, established vanilla growers continue to pay tribute to Mrs Vakaafi as one of the founders of the Niuean vanilla industry. Smallholder farmers echo these sentiments.

Over the years, the objectives of NIOFA have changed. The association started as a way to band smallholder farmers together to obtain group certification in an efficient and cost-effective manner. Under one of our key informant's leadership, organic vanilla production grew in size. This was despite the lack of support from government. NIOFA's focus shifted away from obtaining registered members to concentrating on encouraging young farmers to use organic farming

practices to mitigate the effects of climate change on the environment. A participant believed that this transition to focusing on young farmers was inevitable due to the aging population. Today, the main goal of the association is for Niue to become a fully organic nation by 2020. In partnership with the New Zealand organic certification company BioGro, NIOFA had 48 BioGro-certified farmers in 2016.

In 2017, NIOFA registered 75 members (Mapusua & Maccari, 2007). Just under half of the registered farmers were females. Two of the most experienced vanilla farmers in Niue are women, which emphasises the involvement and prominence of Niuean women in agriculture (see Section 8 for a discussion on the role of Pacific women in the vanilla sector).

Box 4 *Niue Organic Farmers Association (NIOFA)*

The main focus of the Niue Island Organic Farmers Association (NIOFA) is to promote organic farming in Niue and for the island to be organic free by 2020. BioGro certifies organic production in Niue.

Activities:

1. Promoting organic production methods to farmers
2. Coordinating the formation of farmer groups
3. Developing a database to record farmer's details
4. Training in organic standards for persons (people) buying, transporting, storing and processing products
5. IC audits of systems and processes maintained by producers
6. Radio programmes
7. Land clearing and preparations
8. Compost making at the demonstration farm
9. National show days
10. Family activities including planting fruit trees
11. Mentoring and field training

Table 9 Niue Vanilla Activities and Actors.

	DAFF	NVI	Koefaga	NIOFA	Farmer
Vanilla Input Supply					
Finance Vanilla farmers need capital and financial resources to purchase irrigation equipment, labour and materials.	✓	✓	✓	✓	✓
Seedling Supply Vanilla seedlings are sourced from the government demonstration plot and the forest.	✓	✓	✓		✓
Available Land Limited agricultural land is available for vanilla plantations. Thus, the government encourages small plots.	✓	✓	✓		✓
Equipment Equipment includes mulching machinery, tools for pruning and weeding, an irrigation or watering system, and facilities for sorting, curing and processing vanilla beans.	✓	✓	✓		✓
Production					
Planting and Land Management Vanilla plants require high humidity, and a support system to anchor and loop the vines.	✓	✓	✓		✓
Harvesting					
Vanilla beans are ready to harvest 9 to 11 months after pollination. The beans are washed, dried, wrapped and left to ripen. This process usually takes 5–7 days. Cured beans are graded according to length, appearance, vanillin and moisture content. The length of the beans constitutes the key difference between grades.	✓	✓	✓		✓
Value-Added Processes					
Vanilla beans (ripe and cured) are sold to local entrepreneurs for value-added processing.	✓	✓	✓		
Sales and Marketing					
NIUE Vanilla International sells their products in Australia and New Zealand. Koefaga has some overseas sales.		✓	✓		

NIUE Vanilla International

NIUE Vanilla International attended their first Australian Fine Food trade exhibition in 2011. Since then, NIUE Vanilla International has had a stall at both New Zealand and Australia trade shows. NIUE Vanilla International established a partnership with Trade Aid New Zealand to introduce NIUE Vanilla Organic into the New Zealand market. With 32 retail branches around

New Zealand, this partnership could help grow the Niue vanilla industry.

NIUE Vanilla International source a large portion of their vanilla beans from the government demonstration plot. The company is the largest vanilla exporter in Niue and is a significant player in the development of the industry.



Box 5 *Niue Vanilla International*

NIUE Vanilla International is a locally owned family business. The company currently exports to New Zealand and Australia. NIUE Vanilla International's product range includes vanilla paste, extract, powder and vanilla beans, all organic certified through BioGro. The company seeks to promote "NIUE Vanilla Organic through international trade exhibitions and special events [enabling] the company to achieve new and promising opportunities. NVI's marketing strategy varies from market to market and is subjected to market demand and characteristics" (NIUE Vanilla International, 2019).

Young Farmers Network

The Young Farmers Network was introduced in the 1990s in collaboration with a NZAID project (UNDP, 2013). The purpose of the project was to encourage young farmers and develop their capacity to cultivate cash crops. Vanilla was identified as a crop for the farmers to cultivate. Eight participants took part in the programme. In the initial phase, project activities included practicum exercises undertaken on the government plot. Each participant was provided with a vanilla plot under the vanilla programme. However, to the best of our knowledge none of these participants are actively growing vanilla today.

6.6 Summary

Similar to the Cook Islands, the scale of production in Niue is an issue considering the laborious hand-pollination process and delays in obtaining financial returns. There is potential for the vanilla sector to grow in Niue, and there have been numerous attempts to promote this such as government initiatives and NIUE Vanilla International's presence at overseas food shows (developing brand awareness). Vested-interest groups such as NIOFA may play a pivotal role in the development of the sector by helping to strengthen the relationship between the private sector (exporters) and farmers. A continued commitment from the government by investing in extension services to train farmers is also required to develop the vanilla sector in Niue.

7. Vanilla in Samoa

The potential for the development of the vanilla sector is such that the Samoan Prime Minister, Tuilaepa Sa'ilele Malielegaoi, believes “that Samoa has the land, perfect climate and community keenness” to produce vanilla adding “you get much more money from a half bucket of vanilla than a truck-load of coconuts” (Samoa Observer, 2016).

While there are several players looking to further develop the vanilla sector, to date there is only one exporter—Vaoala Vanilla. In actuality, growing vanilla began as a hobby for owner Shelley Burich, who is actively involved in encouraging others to grow premium vanilla in order to create a niche market. She commented: “my aim is to have Samoan vanilla singled out and recognised on its own merits as a high-quality product using the Vaoala Vanilla brand.”

7.1 Overview of the Economy

Samoa is a low to middle-income country, and primarily supported by international development aid,² remittances, tourism, agricultural exports (e.g., taro, coconuts, bananas, yams, coffee, and cocoa), and fishing. Economic activities as measured by GDP increased by 1.1 % in the September 2018 quarter amounting to SAT\$486.6 million (Samoa Bureau of Statistics, 2019). This increase reflects the favourable performances of commerce, public administration, and the accommodation and restaurant industries.

² About NZ\$28 million in official development assistance comes from China, Japan, Australia, and New Zealand.

³ Cyclone Ofa (February 1990) resulted in 10,000 homeless villagers. Cyclone Val (December 1991) and Cyclone Evan (2012) displaced 6,000 people and damaged 1,500 homes on the island of Upolu.

Prospects for medium-term growth are generally considered positive in some sectors. The 2013/14 Household Income and Expenditure Survey (HIES) revealed a decrease in the national basic-needs poverty and hardship indicators for Samoa (Samoa Bureau of Statistics, 2016). This result highlights the successful implementation of government policies and initiatives aimed at raising living standards, especially the hardship experienced by those in rural areas which suffered the most during the previous economic recession.

Climate change is threatening the islands, inhabitants, and the economy, especially in coastal areas, with more destructive tsunamis and cyclones.³ In response to environmental setbacks, government expenditure initiated a major programme of post-cyclone infrastructure repair. Government spending has been the driver of hardship reduction in these rural areas. As for agriculture, new strategies have focused on developing, improving and diversifying crops, and markets and new products have become more prominent.

7.2 The Agricultural Landscape

Agriculture is an integral component of the culture and vital to the Samoan economy with impacts on rural livelihoods, domestic food production, export and niche markets, and investment in agribusiness growth.

The September 2009 earthquake and corresponding tsunami resulted in 200 deaths, disrupting transportation and power generation in Samoa and American Samoa. Cyclone Gita (February 2018) flooded rivers and damaged roads, homes and businesses, mainly in Apia.

Nearly all Samoan households (27,539 or 96%) grow crops for subsistence purposes. Despite its significance in the domestic economy, agriculture contributed just 1.1 % to GDP growth in the September 2018. This translates to a negative 0.6 percentage point of overall GDP growth, adding to the previous four consecutive quarters of decline. Reduced production of major crops such as taro, banana, and ta'amu contributed strongly to the decline in this quarter (Samoa Bureau of Statistics, 2019). Similarly, on a domestic level, the average supply of agricultural produce to the local markets such as the Fugalei Market in Apia declined, emphasising the adverse impact of Cyclone Gita in February 2018, which reduced supply of staple crops and elevated prices (e.g., tomatoes and cabbages).

Samoa, in common with most island states in the Pacific, is vulnerable to exogenous shocks including tsunamis and cyclones, rising sea levels resulting in coastal erosion, displaced villagers, and water contamination. Successive cyclones have caused widespread damage to vital crops, such as taro which had already experienced the taro leaf blight that decimated the plants, thus impacting on total exports and revenue. Rising sea levels and coastal erosion, resulting in the destruction of land and infrastructure, and the displacement of villagers, are a continuous problem for the government (Sutherland, Smit, Wulf, & Naklevu, 2005).

In response to environmental setbacks, the government initiated a major programme of road building and post-cyclone infrastructure repair including rural reconstruction. Government spending has been the driver for hardship reduction in these rural areas (Ministry of Finance, 2016). New government strategies are focusing on developing,

improving and diversifying crops, markets and new products.

7.3 The Vanilla Industry

A recent survey indicates that there are approximately 235 vanilla farmers in Samoa (Table 10), 129 in Upolu and 106 located in Savai'i (larger rural island) (Samoa Agricultural Survey, 2017). There are 36 vanilla farmers in the city of Apia with others scattered around Upolu. Although these figures appear to indicate a sizeable number of vanilla growers, this research found that Shelley Burich of Vaoala Vanilla (see Box 6) is currently the sole exporter of vanilla. Table 7 provides a timeline of events pertaining to the development of the industry in Samoa (and elsewhere in the Pacific).

Table 10 Number of vanilla growers by region.

Region	Number of vanilla farmers
Apia (Urban)	36
North West Upolu	49
Rest of Upolu	44
Savai'i	106

Source: Samoa Agricultural Survey, 2017

Samoa's vanilla industry is organic based. Organic agriculture is closely aligned with the traditional farming methods that Samoans (and other Pacific) farmers have practised for centuries, and environmental integrity remains mostly intact. For export purposes, organic markets need to ensure that products are correctly labelled and meet specific international standards. The organic sector provides essential opportunities for Samoa to export high-value, low-volume crops to niche markets to contribute to and enhance economic sustainability. Currently, Samoa,

Fiji, Niue, Tonga, and Vanuatu are the only Pacific nations that produce organic vanilla. Samoan farmers farm organically by implementing their traditional knowledge and

techniques, and because they are not necessarily aware of other practices or have limited finance.

7.4 Key Actors in the Vanilla Industry

Identifying the main actors that support and generate value along the supply chain is important for understanding how the industry can be inserted into commercial value chains and engage with development goals (Bamber, Fernandez-Stark, Gereffi, & Guinn, 2014). The following discussion outlines the principal actors in the vanilla industry: Government of Samoa, Women in Business Development Incorporated (WIBDI), and Vaoala Vanilla (see also Table 11).

The Government of Samoa

Rejuvenating the vanilla industry requires government support to promote vanilla as the next viable agricultural crop and shift its status from emerging to established.

The Prime Minister’s vision for the industry is that it is developed by small farmers as opposed to commercial-type operations. Samoan farmers are traditionally subsistence farmers and hence there is potential for

vanilla farming to become part of the “aiga” institution of “family doing things together and taking care of each other.”

The state-owned enterprise Samoa Trust Estates Corporation (STEC) is assigned to oversee the growth of the vanilla industry and actively seek market potential and opportunities. In 2013, STEC began growing vanilla and currently has the largest vanilla plantation—approximately 20 acres with 2,000 vines in Mulifanua. STEC has implemented an irrigation system to monitor and maintain the water supply and moisture for the vanilla crops. STEC has a 5-year contract to sell their beans to Vaoala Vanilla, which cures and processes the beans.

STEC is attempting to revive the vanilla industry. STEC staff visit farmers whose vanilla crops are unkempt and teach farmers about vanilla husbandry. Shelly Burich of Vaoala Vanilla provides further vanilla advice.

Box 6 **STEC**

STEC was established under the Samoa Trust Estates Corporate Act (1977) to develop and maintain plantations on Upolu, wholesale and retail cattle, produce and sell coconuts, copra, vegetables, firewood, and livestock. STEC has developed part of its landholdings in Faleolo (10 acres) for vanilla, alongside coconuts and cocoa. STEC is responsible to the Ministry of Public Enterprises and governed by a board of directors.

As a further catalyst to the vanilla initiative, in 2016 the government implemented the Vanilla Governance Committee (VGC) made up of government officials, STEC,

Vaoala Vanilla, and other interested farmers, to revitalise and support the significance of Samoan vanilla.⁴The purpose of the VGC is to facilitate linkages between suppliers and

⁴ To date, there has been one VGC meeting.

markets, as well as to revitalise former vanilla farmers. In addition, the government issued the “Strategy for the Development of Samoa (2017–2020)” that includes the objective of prioritising and investing in agriculture, and government assistance with access to new planting material including vanilla (Ministry of Finance, 2016). Vanilla experts such as Equagold’s Ross and Diane Appleton from New Zealand have been commissioned by the government to train vanilla farmers and provide business strategies to strengthen and market new international opportunities.

Women in Business Development Incorporated (WIBDI)

In 2008, WIBDI (See Box 7) began to support farmers who were interested in growing vanilla, with training. WIBDI was instrumental in the initial start-up of the fledging vanilla industry and became a primary provider of training, marketing, financial credit assistance, and business management skills to vanilla farmers. WIBDI has had and continues to have more success than most other organisations throughout the Pacific. In support of WIBDI’s efforts, the Samoan government provided financial assistance to aid and promote the vanilla industry.

WIBDI recruited international vanilla experts from Tahiti, Fiji, and Vanuatu, and elsewhere, including New Zealand-based firm Equagold (see Box 8) to train farmers how to grow vanilla as well as in vanilla husbandry skills. WIBDI initially worked with 60 vanilla farmers, one of whom was Shelley Burich of Vaoala Vanilla. Over time, the number of vanilla farmers has dwindled to nine.

The decline in part can be attributed to the loss of enthusiasm over the length of time involved in growing vanilla as well as the

damage caused by cyclones. Two WIBDI staff members regularly visit those farmers still growing vanilla and assist with vanilla maintenance such as providing pulu (coconut husk) mulch, for ground cover, and mulching machinery. WIBDI continues to seek niche markets for Fair Trade-labelled vanilla beans.

What began as a hobby for Shelley Burich in 2008, with 50 Bourbon vines obtained through WIBDI, later transformed into a prospering business. Today, Vaoala Vanilla has a quarter-acre plantation with 240 fruiting vines, including 100 tahitensis variety. Although Shelley has attended WIBDI training courses on vanilla husbandry, to date most of her success has been achieved through trial and error. In 2010, her property was organically certified by the National Association for Sustainable Agriculture Australia (NASAA) through WIBDI. In 2016, a small shipment of vanilla beans was exported to Japan, as well as to SHE Chocolate in Christchurch, and three Australia-based companies.

Vaoala Vanilla

What began as a hobby for Shelley Burich in 2008, with 50 Bourbon vines obtained through WIBDI, later transformed into a prospering business. Today, Vaoala Vanilla has a quarter-acre plantation with 240 fruiting vines, including 100 tahitensis variety. Although Shelley has attended WIBDI training courses on vanilla husbandry, to date most of her success has been achieved through trial and error. In 2010, her property was organically certified by the National Association for Sustainable Agriculture Australia (NASAA) through WIBDI. In 2016, a small shipment of vanilla beans was exported to Japan, as well as to SHE Chocolate in Christchurch, and three Australia-based companies.

Box 7 *Women in Business Development Incorporated (WIBDI)*

Established in late 1991 by founder and CEO Adi Maimalaga Tafuna’I, WIBDI supports Samoan women and families in climate-threatened communities in establishing sustainable enterprise. WIBDI’s original purpose was helping aspiring females raise finance for their business ventures.

However, recent environmental events have led WIBDI to focus on lessening poverty in the rural districts through sustainable economic development, honouring indigenous customs and fair trade. In doing so, WIBDI seeks to identify new opportunities for Samoan families through sustainable village economies and create crucial linkages between rural communities and global markets. WIBDI experienced success in developing family-based businesses and addressed the lack of institutional support for female entrepreneurs in business and finance. Their success can be attributed to WIBDI’s business model: identify and exploit sustainable opportunities that produce a total holistic package—one that is economically, culturally and socially advantageous to families and underpinned by Fa’aSamoa values.

WIBDI has experienced success in developing family-based businesses where aid programmes have failed.

WIBDI has been working closely with Oxfam New Zealand (since 2003)⁵ and the Tindall Foundation to receive FairTrade certification for ginger and cocoa. Examples of successful business ventures include the international export to The Body Shop International (UK) of organic certified virgin coconut oil from 2007; and Misiluki bananas that were exported to NZ but were perceived as “over-ripe” and were reworked as banana “chips” (Cahn, 2008).

Box 8 *Equagold Limited*

Equagold (2018) directors Ross and Dianne Appleton supply vanilla and spices to buyers in New Zealand and Australia. Their interest in vanilla sourced from the Pacific emerged as a result of the short supply of vanilla from Madagascar. After researching alternative sources, Appleton found a supplier from Papua New Guinea. As such, Equagold is the leading distributor for the Torricelli Cooperative in Australasia.⁶

The Appletons were highly recommended as vanilla experts and mentors for the Samoa vanilla industry, having opened marketing opportunities for the Papua New Guinean vanilla farmers. As such, the Samoan government personally invited the Appletons to train Samoan vanilla farmers. At an event held at Apia’s Travellers Point Hotel, the Appletons showcased their vanilla successes, business concepts, and models to interested farmers to garner interest concerning vanilla production in Samoa (Huckert, 2016).

⁵ Oxfam provides partnership, training, technical assistance, capacity development, market linkages and financial help to WIBDI.

⁶ Torricelli supply 80 % of Equagold’s vanilla stock.

As of 2018, Vaoala Vanilla is the sole Samoan export company with diverse vanilla offerings that increase earning power and potential for new partnerships. Vaoala Vanilla's value-added products include vanilla paste, extract, and powder (Fuavao, 2017). In order to expand the business, Vaoala Vanilla has entered into informal contractual agreements with smallholder vanilla farmers and STEC to purchase vanilla beans. Unlike other developing countries that mostly export primary products with little processing (Bamber et al., 2014), Vaoala Vanilla exports packaged

and processed beans. Given their unique position, Vaoala Vanilla must continue to produce quality products at a competitive cost to maintain their status.

On a community scale, Vaoala's framework has the potential to train farmers in vanilla cultivation and thus may lead to developing sustainable livelihoods in providing income for farming families. On a broader scale, this strategy sustains Vaoala's inclusion and participation in the development of capacity and production in Samoa.

Box 9 *Vaoala Vanilla*

Shelley Burich is the owner of Vaoala Vanilla—*vao* means forest, plants and garden; *ala* means to give life.

Her career in vanilla farming began as a hobby and she began planting in 2008, with 50 Bourbon vines.

She is the only local grower/exporter who provides training and mentoring to STEC and other vanilla farmers. Shelley is also a member of the Vanilla Governance Committee.

Shelley attended WIBDI training courses on vanilla growing and processing run by experts from Tahiti, Tonga, and Vanuatu, and credits a lot of her learning to the “Vanuatu Bible” that is, the *Vanilla Agriculture and Curing Techniques Handbook* by Bianchessi (2012).

Shelley views her farm as an extension of her aiga (family), “as a mother to a child” symbolising a “close affinity to mother earth.”

“Vision: to be a ‘standalone’ niche product and not lost in one big conglomerate pile of beans where we lose our identity. Looking for buyers that offer niche, specialty type stores.”

Aim: to have Samoan vanilla singled out and recognised on its own merits as a high-quality product using the Vaoala Vanilla brand.

Business motto: “Grown by nature, nurtured with love.”

7.5 Summary

In summary, at present there is only one key grower/exporter of vanilla in Samoa. There are a number of initiatives in place to

encourage the development of other growers. The vested interest and support from the government and NGOs does

indicate Samoa is taking key primary steps to include vanilla as a sustainable crop with high-quality value-added export products that are crucial for commercial viability.

These provisions are essential for entrance into commercial value chains and expansion to international markets.

Table 11 Samoa vanilla activities and actors supply chain.

	WIBDI	STEC	Vaoala	Farmer
Vanilla Input Supply				
Finance Financial resources needed to purchase equipment, storage facilities and other services for intensification of vanilla production.	✓	✓	✓	✓
Seedling Supply Vanilla seedlings are sourced from established farmers such as Shelley Burich of Vaoala Vanilla, WIBDI and STEC.	✓	✓	✓	
Available Land A quarter acre is sufficient for small family plantation. STEC and Vaoala have larger holdings.	✓	✓	✓	✓
Equipment Mulching machinery, tools for pruning and weeding, an irrigation system, and facilities for sorting, curing and processing.	✓	✓	✓	✓
Production				
Planting and Land Management Vanilla plants require shade, high humidity, and a support system to anchor and loop the vines. Organic cover, notably Pulu (coconut husks) and other foliage are used to retain moisture. The rows of vanilla plants are boxed either with wood or stone boulders for easier access and water retention.	✓	✓	✓	✓
	✓	✓	✓	✓
Harvesting				
Hand pollination is best in the early hours of the morning. Beans are picked and sorted according to size, texture, and quality. STEC and other contracted farmers sell their beans to Vaoala.	✓	✓	✓	✓
Beans are sweated, cured and dried over 3 months after which their colour turns to dark brown with a leathery texture and they are ready for the markets.	✓		✓	
Logistics				
Vanilla beans stored onsite before collection by Vaoala (STEC and contracted farmers).			✓	
Sales and Marketing				
This research could not substantiate claims of domestic vanilla sales other than Vaoala purchasing beans from STEC and small vanilla farmers. Internationally, Vaoala has exported a small shipment to Japan, New Zealand, and three Australian companies. Vaoala's website continues to garner interest from external traders. ⁷			✓	

⁷ See <https://www.facebook.com/vaoalavanilla/> and <https://www.linkedin.com/in/shelley-burich-862a44109/>



8. Opportunities and Challenges for Vanilla in the Pacific

8.1 Introduction

In this section, we summarise our key findings in terms of the project objectives and the extent to which the vanilla sectors have been incorporated into commercial value chains.

We then undertake a SWOT (strength, weaknesses, opportunities, and threats) analysis. SWOT is a strategic management

tool used to identify the internal strengths and weaknesses, as well as external opportunities and threats, for the vanilla industry in each of the three countries. While there are commonalities across these countries, there are also differences given the participation of key actors, and the level of maturity of vanilla production.

8.2 Incorporation into Commercial Value Chains

Our findings suggest that there is limited incorporation of the vanilla sectors in each of these countries into commercial value chains (see Table 12; see also Figure 13 which maps out the GVCs for the vanilla sector in each of the countries). Where incorporation is occurring, local entrepreneurs such as Vaoala Vanilla in Samoa and NIUE Vanilla International have driven it. While they are actively positioning the quality of their respective products—and by extension the quality of Samoan and Niuean vanilla respectively—they are, however, constrained by a lack of supply in order to meet potential international demand.

Our findings are based on interviews with 27 key informants, in which we focused on the supply side of the vanilla industry in each country. In doing so, we note similarities with the experiences that other islands in the Pacific have had in seeking to grow vanilla as a premium market export crop. We draw on the work of agricultural and vanilla experts in the Pacific, Andrew McGregor and Piero Bianchessi, to contextualise and validate our findings.

Exogenous forces such as market demand, supply from major exporting countries, geographic isolation and natural disasters

hinder the development of vanilla sectors. Our research indicates that intercropping is a way of mitigating a few of these external hindrances. For instance, intercropping allows farmers to generate short-term income during seasons of low vanilla prices. This finding is in line with McGregor (2004) who suggests the integration of niche crops such as vanilla into existing farming systems can generate a sustainable income for farmers.

Our findings show that organic certification is a key driver in achieving upgrading opportunities. McGregor and Stice (2014) substantiate this claim and state that “certification proved to be an important tool in providing credibility to a company marketing vanilla from a remote Pacific Island location” (p. 117). Further to this, organic certification is essential to developing a high-value, niche agricultural product such as vanilla. Bianchessi (2004) further supports this claim and notes that high-value niche commodities such as vanilla require demanding quality requirements that include clear organic certification standards.

Our findings are also in line with McGregor’s (2004) study into the Papua New Guinea vanilla industry where he found that vanilla training is essential to the development of the sector. In order to produce premium

and high-quality beans, training must be consistent across the board, from vanilla cultivation to post-production processes. Our research indicates that although the respective islands have made concerted efforts to develop farmers’ technical skills through training programmes, little has been done to streamline farming practice to produce better quality beans for market. Bianchessi (2004) notes that in most areas in the Pacific, a vast number of vanilla farmers have no access to training materials, and have been farming and curing vanilla with little or no information.

Adopting a “pull” supply chain strategy is vital to the development of the vanilla industry (PIFON, n.d.). Relationships are a significant part of the pull strategy and our research shows that there is potential to harness links between farmers and processors in order to pull the vanilla product through the chain. This finding is validated by McGregor and Stice (2014) who state “in successful value chains, agribusiness pulls the products through the chain” (p. 47). PIFON (n.d.) further supports our finding in recognising that farmers who take a “push” strategy (supply-driven export) may suffer due to being in a poor negotiating position and having inaccurate demand forecasts.

Table 12 Summary of findings.

Project Objectives	Cook Islands	Niue	Samoa
Background.	Vanilla was introduced into the Cook Islands in 1942 with the plan for vanilla to become a commercially viable product. Nevertheless, this failed due to lack of access to markets, transportation, and lack of farm management skills.	It is unknown when vanilla was first introduced to Niue. Key actors involved in the industry have suggested that it was introduced by missionaries or alternatively brought back by forefathers on exploration journeys.	Vaoola Vanilla began cultivating vanilla in 2008. Owner/operator of Vaoola Vanilla, Shelley Burich, continues to grow vanilla and is the only active exporter of vanilla beans from Samoa.

<p>Examine the extent to which the vanilla industries in the Cook Islands, Niue and Samoa have been incorporated into viable commercial value chains.</p>	<p>No incorporation.</p> <ul style="list-style-type: none"> • There are eight established vanilla nurseries; however, the plants have yet to produce beans. • Participants highlighted their strategy of focusing on developing a sustainable supply of vanilla to the local market before trying to meet international demands. • There is potential in strengthening value-added processes in the Cook Islands. One key buyer in Rarotonga is currently purchasing green vanilla beans from individual farmers for wine flavouring, perfumes, oils and extracts. 	<p>Limited incorporation.</p> <ul style="list-style-type: none"> • The government owns one of the most productive vanilla farms. This is a 50-acre vanilla plantation with a drying/curing shed. • NIUE Vanilla International is one of the most established local exporters. It is a family-owned business that is spearheaded by a local entrepreneur, Stanley Kalauni. NIUE Vanilla International purchases dried and cured beans from the government plot and independent smallholder farmers. NIUE Vanilla International currently supplies Trade Aid stores in New Zealand and is actively involved in food shows in New Zealand and Australia. 	<p>Limited incorporation.</p> <ul style="list-style-type: none"> • Vaoala Vanilla is the only exporter of vanilla beans. It has exported a small shipment to a family-owned Japanese wholesaler who is keen on forming a partnership. In addition, there is some interest from a Christchurch-based chocolate making company and three Australian companies. • With the assistance of WIBDI, C1 Espresso (Christchurch-based company) has discussed buying all the vanilla processed by Samoan farmers. In addition, the UK-based Body Shop cosmetics has expressed interest, asking for Samoan vanilla samples (through WIBDI). It is unknown whether these transactions occurred or progressed to export status.
<p>Assess the potential impact of the incorporation of the vanilla industry into commercial value chains on sustainable economic and social development each of the countries.</p>	<p>Participants see potential implications for economic development of incorporating the vanilla industry into commercial value chains; however, all three countries are at a nascent stage of development.</p> <p>In order to achieve sustainable economic growth, there is recognition of the importance of targeting premium niche markets for vanilla. However, currently there is, in general, a lack of knowledge about markets and market opportunities. Once relationships are formed with key buyers/markets, and the industry is strengthened, then there is the potential for sustainable economic development. In strengthening relationships with key buyers, the vanilla products can be pulled through the chain.</p> <p>Further, as the industry grows, there is greater potential for inclusive development, which in turn can benefit women as growing vanilla is a gender-neutral agricultural activity. Our research found that women play a significant role in the production of vanilla. In Niue, for example, two of the most experienced vanilla farmers are women, one of whom exports her vanilla products to New Zealand. While in Samoa, WIBDI was instrumental in the initiation of the vanilla sector and has become a primary provider of training, marketing and financial credit assistance to female vanilla farmers. This emphasises the involvement and prominence of women in the vanilla sectors.</p> <p>Research shows that high-value agricultural products such as vanilla make up approximately 65% of all developing countries' exports (Gyau, Tchoundjeu, & Franzel, 2011; McGregor, 2007). Samoa, for instance, has relied on traditional high-value agricultural products such as cocoa as key contributors to economic growth. We suggest that vanilla has the potential to contribute to economic and social development. However, for economic and social development to occur, farmers need training on all stages of growing and producing vanilla as well as on market opportunities.</p> <p>It is also important to recognise that inherent of development research, social and economic development implications are difficult to measure. Social development outcomes are often only visible several years after intervention.</p>		
<p>Identify key drivers or constraints in achieving upgrading opportunities.</p>	<ul style="list-style-type: none"> • Heilala Vanilla founder John Ross was invited by government agencies to assist in training farmers and provide technical advice and 	<ul style="list-style-type: none"> • NIOFA focuses on certifying vanilla growers for export markets. • NIOFA registered 48 BioGro-certified farmers. 	<ul style="list-style-type: none"> • WIBDI have been a source of training, financial credit assistance and business management skills to vanilla farmers. The organisation

<p>Drivers</p>	<p>expertise on value-added processes.</p> <ul style="list-style-type: none"> Participants agree that partnerships with companies such as Heilala Vanilla will encourage farmers to focus on upgrading opportunities and provide channels to international markets. Government provided small credit loans to vanilla famers. However, uptake of these loans was low. 	<ul style="list-style-type: none"> NIOFA continues to support local growers by mobilising resources and providing specialised expertise to farmers. Participants noted that NIOFA is a key agency for developing capacity, streamlining funding and mobilising resources. 	<p>continues to advise vanilla farmers and provide credit loans.</p> <ul style="list-style-type: none"> SROS is currently working on the “Vanilla Extraction Project” as part of their postharvest method for extraction, which farmers could use to add value to their vanilla beans rather than sending them abroad for processing.
<p>Constraints</p>	<ul style="list-style-type: none"> Key informants suggested that a co-operative structure would be the most suitable organising mechanism to streamline efforts around the four layers of business involving the growing of vanilla, curing, processing and marketing functions. Currently, farmers are independent and thus are unable to benefit from economies of scale to lower their costs and opportunities to value-added processes. Difficulties in accessing credit for agricultural activities has resulted in limited investment and minimal expansion of existing and potential agricultural business enterprises. Farmers claim there was little information concerning the eligibility criteria for credit loans, which discouraged applicants. Informants noted that lack of enthusiasm from more experienced farmers is due to absence of funding available to develop shade houses and the inadequate extension support services. Lack of agricultural space available for vanilla planting. 	<ul style="list-style-type: none"> Participants discussed the lack of capacity in DAFF to support local growers. Due to financial cuts, the government department reduced the extension services they provide to local farmers. This has had a negative effect on quality control, capacity building and upgrading opportunities. Migration is a significant issue for economic development in Niue. Farmers stated the decline in available workers for the pollination process is a significant constraint to achieving upgrading opportunities. NIUE Vanilla International is employing workers from the Philippines and India to mitigate the labour shortage. Similar to the Cook Islands, one of Niue’s constraints to achieving upgrading opportunities is the lack of enthusiastic vanilla farmers. Participants shared their concerns regarding the sustainability of the agricultural sector considering the lack of young farmers. 	<ul style="list-style-type: none"> The process of growing vanilla can take up to 3 years to come into production, therefore, vanilla farmers need to be fully committed for the long term and realistic about the current market prices and the true international value. Although some farmers in Samoa already have experience in growing vanilla, the knowledge about lucrative cultivation of the plant is still a mystery to most of them. Local markets are very small. Farmers living in rural areas are unable to maintain export markets without financial support and therefore, are not capable of producing the large quantities and quality of products demanded.
<p>Assess the means by which public/private partnerships can successfully provide market access opportunities to farmers.</p>	<ul style="list-style-type: none"> Participants noted the need to develop a sustainable supply of vanilla to meet the local market demands. Participants noted the need for MAFF, BTIB and farmers to focus on developing facilities and training for value-added process. There is no comprehensive programme to connect 	<ul style="list-style-type: none"> Participants noted the lack of a strategy to connect with the vanilla market. In 2016, NIUE Vanilla International products were the first Pacific Island food products to be stocked in Trade Aid stores in New Zealand. In 2007, FAO (Food and Agriculture Organization) funded an agro-processing 	<ul style="list-style-type: none"> Equagold is a New Zealand-based company that specialises in spices. The directors, Ross and Diane Appleton, were commissioned by the government to train vanilla farmers and provide business strategies to strengthen upgrading opportunities.

<p>farmers with the vanilla market.</p> <ul style="list-style-type: none"> • Farmers are unaware of what comes after vanilla harvesting other than domestic sales. • Without further government and NGO assistance, farmers will find it difficult to secure export deals, form partnerships and opportunities for expanding their income. 	<p>facility on the DAFF compound. The purpose of the project was to encourage and enable farmers to process agricultural products for export markets.</p> <ul style="list-style-type: none"> • Only one vanilla farmer had used the facility. Informants suggested that a lack of expertise, training around processing and specific vanilla processing equipment has restricted the use of the experimental kitchen.
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Figure 13 Vanilla value chain in the Pacific Islands.

		Cook Islands	Niue	Samoa
INPUT	Available land	Limited arable land is available. Land once used for agricultural production has been converted to residential or commercial (usually tourist) use.	There are several constraints in locating appropriate soil conditions for production. For example, the minimal depth of the organic layer above the base rock, outcrops and surface boulders (DAFF, 2014). Moreover, the continuous cultivation of land cleared for food production has resulted in a reduction of land space available for cash crops.	Land for vanilla production ranges from a quarter acre to STEC's larger plantations (20 acres). Land clearing of rocks for vanilla plantations in Samoa is problematic given that 50 % of the island contains sizeable volcanic rocks that heat the soil and affect the moisture content (Mapusua & Maccari, 2007). According to one farmer, the extent of the volcanic rocks on his land discouraged him from growing vanilla. The limited land available, coupled with the labour-intensive work required to remove the rocks, resulted in smaller plots with minimal yields.
	Finance	The government allocated NZ\$ 150,000–250,000 in 2016 followed by NZ\$100,000 in 2017 to the vanilla programme. BTIB provided additional funds and technical expertise to support vanilla farming.	The Niue Development Bank offer financial packages in the form of loans and grants for agricultural production.	Capital for vanilla farmers available through the government.
	Seedling supply	Farmers source seedlings from the forest where vanilla grows wild or from established plantations.	DAFF provide seedlings from their demonstration plot located in Alofi. Vanilla seedlings are sourced from the forest.	Vanilla seedlings are sourced from established farmers, Vaoala Vanilla, WIBDI, and STEC.
	Equipment	<ul style="list-style-type: none"> • Shade houses • Drying plate form • Mulching machine (not required but encouraged by DAFF). 	<ul style="list-style-type: none"> • Drying plate form 	

In addition to irrigation systems and facilities for drying and storage other equipment includes:

PRODUCTION	Production process 	<p>Pollination is a labour-intensive task. Manual pollination is done by hand with a small stick. To produce 1 kg of cured beans requires 600 hand-pollinated blossoms.</p>		
		<p>Commonly used support trees:</p> <ul style="list-style-type: none"> • Kāpaiē (<i>Panax</i>) • Ficki (fig trees—<i>figus carica</i>) • Kaute 'Enua (hibiscus tree). 	<p>Commonly used support trees:</p> <ul style="list-style-type: none"> • Coconut trees (<i>cocos nuifera</i>) • Fig trees (<i>figus carica</i>) <p>Poor soil conditions and labour shortages hampered the development of a sustainable supply of vanilla. Farmers use coconut husks and other foliage to retain the moisture in the soil.</p>	<p>Commonly used support trees:</p> <ul style="list-style-type: none"> • Tamaligi Palagi (<i>Falcataria moluccana</i>) • Tamarind (<i>Tamarindus indica</i> L.) • Pafiki (<i>Atophthora</i>) <p>Pafiki is prone to disease such as rot, particularly when covered with compacted vines.</p>
PROCESSING	Harvesting and curing 	<p>The drying and curing process undertaken by farmers in each country is the same. Curing is a labour-intensive and time-consuming process. Farmers often dry and cure their beans. Alternatively, green beans are sold to buyer/processor/exporter to cure.</p> <p>Common curing techniques used</p> <ul style="list-style-type: none"> • Water (requires blanching beans in boiling water) • Sun curing (using drying plate) • Box/snap lock bag sweating <p>The drying plate form is made out of corrugated iron, the beans placed on the plate, which is laid out in the sun. Cured beans should be dark brown in colour, oily, supple, and wrinkled.</p> <p>Cured beans are sorted, graded and packaged. The length of cured beans constitutes the real difference in grades. Correctly cured, vanilla can be stored for extended periods of time without compromising the quality.</p>		
	Processing 	<p>Vanilla value-added processes in the respective countries are small scale and straightforward without a lot of value-adding occurring.</p>		
MARKET	Sales and marketing 	<p><i>Te Winery Extractors and Distillers</i> is the only buyer on the island. The company buys green beans from local growers for wine flavouring and perfume.</p>	<p>NIUE Vanilla International's presence at trade shows in Australia and New Zealand has enabled the company to develop a brand name for themselves and network with retailers and industry competitors.</p>	<p>This research could not substantiate claims of domestic vanilla sales other than Vaoala Vanilla purchasing beans from STEC and other smallholder farmers.</p>

8.3 SWOT Analysis

This section discusses the strengths, weaknesses, opportunities and threats for the vanilla industry in the three countries. The key points are summarised in Figure 14.

8.3.1 Strengths

Ideal climate and small land required for vanilla production

Vanilla is best grown in tropical climates being 20 to 25° north and south of the equator and with about 80 % humidity (Medina, Guadalupe, Jimenes, & Garcia, 2009). As such, certain locations in the Cook Islands, Niue, and Samoa are suitable for vanilla production (Matenga, 2017a). A quarter acre of land (about 1,011 square metres) is enough for smallholder farmers to start growing vanilla. Hence the prospects for growing vanilla in these countries, given the essential climatic conditions and land space, have promising potential.

High-value, niche and non-perishable agricultural crop

Vanilla is a particularly attractive agricultural crop for farmers in isolated locations for a number of reasons. When cured, vanilla is non-perishable and thus requires no maintenance during transportation. This makes it a particularly attractive crop for farmers in the outer islands such as Mangaia in the Cook Islands, with poor transportation links. Moreover, intercropping allows the farmers to capitalise on the high prices of vanilla, while being able to maintain a regular income stream through other crops such as pine-apple. Thus, vanilla is a niche, high-value crop that can provide economic benefits to farmers in isolated communities.

Government participation and initiatives

Each government recognises the need to build internal capacity and produce linkages with the local economy. They have undertaken initiatives to provide opportunities for farmers. They have also recognised the importance of routes to external markets.

Culturally specific skills and techniques

Samoa has developed culturally specific skills and techniques that apply to vanilla. As an example, certifying and producing quality beans led to Vaoala Vanilla developing a series of innovations and skills in their postharvest handling systems and an innovative method of eradicating the giant African Snail using organic methods rather than pesticides and sprays. These “niche” processes strengthened their intellectual property and position as, perhaps, the “number one vanilla champion” in Samoa.

8.3.2 Weaknesses

Human capital and labour supply

Emerging farmers need to upgrade their skills with training and practical vanilla know-how in order to remain competitive. The lack of human capital in each country is further intensified by the relocating of youth to the main cities and their peripheries where there is work and better pay from tourism and hospitality, rather than remaining in rural districts often associated with minimal pay and laborious work. Therefore, the succession of the next generation of farmers is burdened by the impact of urbanisation.

Infrastructure and services

It is vital to acknowledge that infrastructure is often compromised during natural disasters, which the Cook Islands, Niue, and Samoa have all experienced. For these reasons, there is a high probability of a weakened infrastructure and services that will need strengthening for future vanilla production.

Information and technology flow

Information flows are essential for streamlining operations (Bamber et al., 2014). Similarly, disseminating critical information from the top level and across sectors supports and strengthens the sustainability of local farmers, communities and the economy. Therefore, essential processes that are vital for the value chain such as production, technology, and vanilla know-how are restricted to smaller networks.

The limited flow of vanilla information between people and organisations in the Cook Islands, Niue and Samoa impedes the development and production of vanilla. Information on other critical parameters, such as production levels, vanilla prices, and potential markets, is seemingly confined to specific individuals. According to the findings of this research, the lack of available documentation to support vanilla husbandry such as a “vanilla manual” with standard operating procedures and maintenance information constrained new farmers from progressing further.⁸ Necessary linkages and cooperation between the public and private sectors and other key stakeholders were noticeably absent or limited, the notable exceptions being STEC and Vaoala Vanilla in Samoa and the DAFF experimental farm in Alofi on Niue.

⁸ The exception being the Vanilla Agriculture and Curing Techniques Handbook authored by Bianchessi (2012). Many Pacific vanilla farmers do

Commitment, disinterest, and disillusionment

Vanilla farmers need to be fully committed for the long term and realistic about the current market. As vanilla is not a traditional crop grown in the Pacific nations, there is low domestic-consumer demand and limited information on how to successfully grow, harvest, and export vanilla, in particular the length of time needed.

The findings of this research indicate that emerging farmers were not always fully informed of vanilla’s real value on a global scale and consequently lost interest in the waiting time, hence their limited understanding of the current functionality and value of vanilla for local farmers and their participation in the value chain. This is consistent with McGregor’s (2004) findings where farmers in Vanuatu prematurely departed from the industry due to dramatic price falls. A similar situation occurred in Tonga. In the 1980s the Tongan industry was well established and vanilla prices were at an all-time high (FAO, 2018; McGregor, 2004). However, the kava boom in the late 1990s coincided with a period of relatively low vanilla prices. Many farmers abandoned vanilla, cutting down vines to plant kava.

In addition, government support and commitment may diminish due to excessive attempts at establishing the industry without any foreseeable results or substantial success. Therefore, long-term commitment and evaluation systems are necessary to empower individuals to maintain interest and promote innovation, and to monitor feedback and effectiveness.

not have internet access to obtain this manual or money to buy the manual. See Recommendation 1.

Market integration

To compete in a global marketplace, small island economies need to find markets they are capable of servicing. While there have been a few successful international exports, there is a lack of internal demand for vanilla. Smallholder farmers living in rural areas are most likely incapable of producing greater amounts of an acceptable quality demanded on the global marketplace. Therefore, some farmers may find it challenging to enter productive business relationships thus limiting their growth and participation in the value chain.

Smallholder farmers and island organisations may find it difficult to enter international collaborations and build relationships with potential trading partners. In addition, without the support of NGOs and respective governments, farmers' access to niche export markets may be limited or non-existent (Fairbairn, 1994). Moreover, developing productive long-lasting business relationships with international purchasers often entails trust and access between the partners (Sherzad, 2015). Trust forms part of a robust approach to sustainability. Hence, both sides need to take time to build mutual trust and access to meet their respective demands and survive in the value chain. The benefits that can accrue from expanding to external markets may contribute to economic growth for these island nations. The findings of this study indicate that the key foreign players for the Cook Islands, Niue and Samoa included Heilala, Equa-gold, Trade Aid, and other smaller international businesses.

8.3.3 Opportunities

Nationwide organic certification and standards

Developing countries often lack the technical expertise and capital to implement

standards and certification (OECD, 2008). This hindrance is unfortunate given that standards and certifications are determinants of competitiveness and improve quality and productivity (Bamber et al., 2014). However, Niue and Samoa both use established standards. Niue adheres to BioGro—New Zealand's organic certification—with 48 registered and certified farmers in 2016. Vaoala Vanilla (Samoa) is organically certified by NASAA. This certification differentiates Vaoala from other domestic emerging vanilla producers in Samoa and throughout the Pacific.

Diversification of vanilla for economic growth

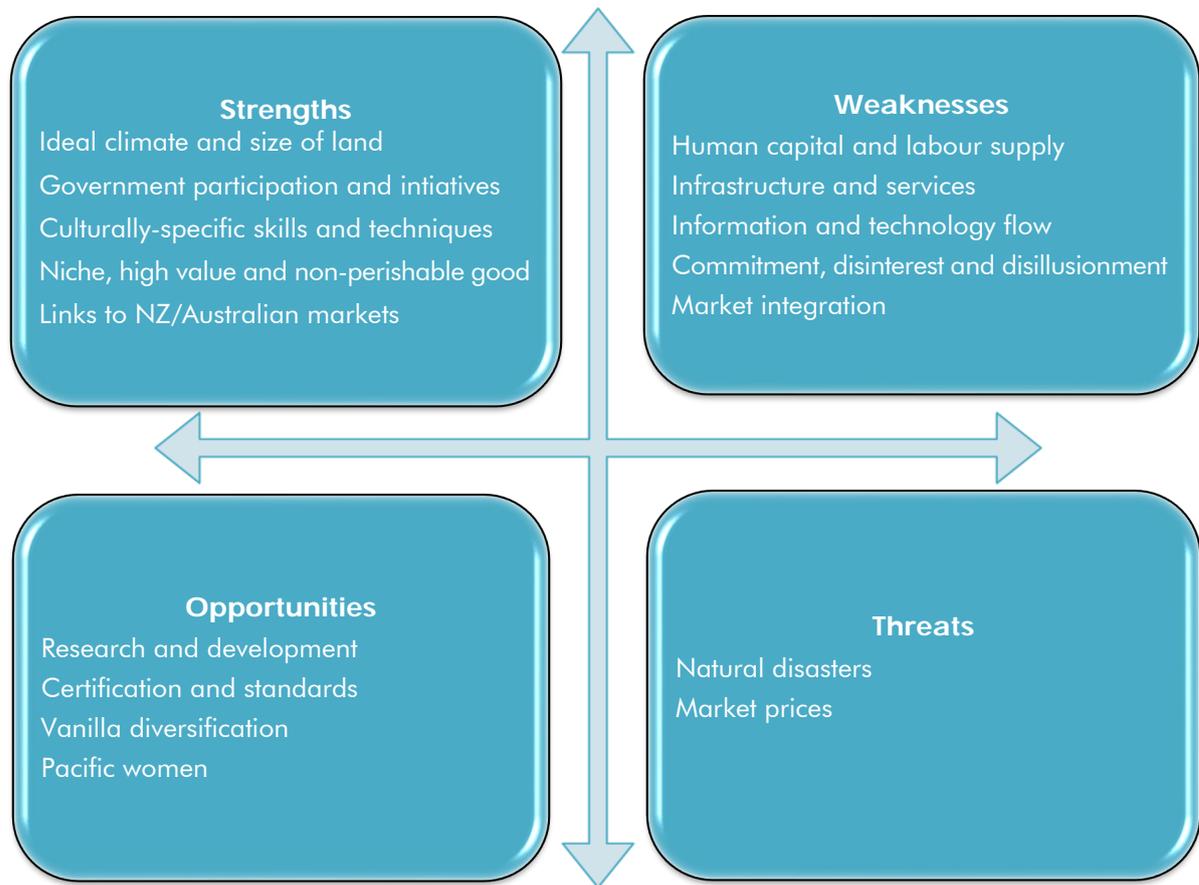
Diversification of products is key for economic growth (higher GDP) insofar that the lack of specialised products may increase exposure and vulnerability to unfavourable external shocks and macroeconomic unpredictability (Papageorgiou & Spatafora, 2012; Rondeau & Roudaut, 2015). There is potential in each country to diversify vanilla offerings from production (harvested beans) to processing as evidenced by Vaoala Vanilla and NIUE Vanilla International that exports beans alongside vanilla paste, extract and powder. That being said, diversification into other vanilla products requires upgrading processes.

Pacific women in vanilla

Vanilla has emerged as a gender-neutral agricultural product with implications for social development in the Pacific Islands. Traditionally women have faced gender-based constraints to participation in agricultural value chains; however, women today are taking an active role in vanilla farming.

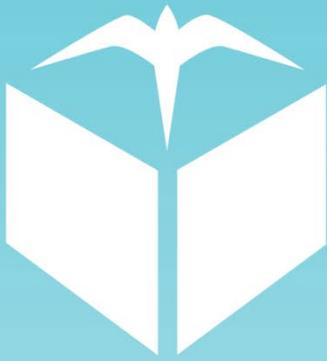
Women play a vital role in the pollination process—a delicate exercise requiring

Figure 14 SWOT Analysis for vanilla production.



accuracy and speed. Key players in various Pacific Islands have committed to increasing the participation of women in vanilla production. In Tonga, Heilala Vanilla has pledged to employ 200 women in the vanilla industry by 2022. The Cook Island's (former) Minister of Agriculture actively sought to promote the inclusion and participation of women in different stages of the value chain from production to marketing. Today, one of the most successful and productive vanilla shade houses in Rarotonga belongs to a woman. Another aspiring female vanilla grower is currently constructing her own shade house down the road. Further to this, there are two established female vanilla growers on Rarotonga.

This positive trend of active participation of females in vanilla production can also be seen in Samoa where WIBDI actively encourages new farmers to grow organic vanilla. Most of their new and emerging farmers tend to be women. Samoa's most successful vanilla farmer is Shelley Burich of Vaoala Vanilla. Similarly, in Niue, local farmers acknowledge a woman, Mrs Rauru Vakaafi, as one of the trailblazers of the vanilla industry and founder of the NIOFA. Although Pacific women face many challenges to participating in agriculture, non-governmental organisations such as WIBDI and NIOFA continue to encourage and empower woman in the economy through sustainable practices aimed at lessening poverty.



8.4.4 Threats

Natural disasters

The Cook Islands, Niue, and Samoa are vulnerable to natural disasters, climate change, and global recessions due to the high portion of low-lying areas, small population size and the export infrastructure of the island. Moreover, during the wet and dry seasons, there can be extreme fluctuations in rain fall, and sea levels will continue to rise (Sutherland et al., 2005). As such, increased water levels further exacerbate coastal erosion and nearby land, property, and infrastructure. The effects of natural disasters may discourage farmers from vanilla planting. Therefore, the notion of natural occurrences damaging the future of vanilla crops in these countries makes growing vanilla fraught with risk.

Price volatility

Vanilla prices can quickly fluctuate and impact on the economy and vanilla farmers of these countries. A substantial contraction in the global supply of vanilla may lead to spiked prices, whereas the expansion of supply often results in reduced prices. A drop in the global price for vanilla may persuade Pacific farmers to return to traditional subsistence cash crops like taro, copra, and fish to supplement their income. The threat to these countries is the global stability of vanilla production that could lead to a sharp decline in the demand for vanilla.

9. Recommendations

We firstly provide general recommendations followed by specific country-level recommendations.

As noted in Section 2, Bamber and Fernandez-Stark (2012) identified four key pillars that stakeholders should focus on in regard to inclusive development. In applying the four pillars to the Pacific Island context, we instead use the term *pou* (posts) as this is an appropriate and culturally relevant term in the Pacific Island context. In particular, we focus on two of the pou (pillars): training and market access. The other two pou, collaboration and finance, inform and underpin our discussion relating to the first two. Figure 15 illustrates the four pou with a particular focus on access to markets and access to training.

Figure 15 Four pou of sustainable inclusion for the Cook Islands, Niue and Samoa's vanilla sector.



9.1 General Recommendations

Appropriate value chain training

Recommendation 1

Governments and donors fund a reprint of Piero Bianchessi's *Vanilla Agriculture and Curing Techniques Handbook* for distribution to vanilla growers in the Pacific.⁹

Commentary:

While many of the growers have worked in agriculture for their whole lives, specific training is needed to improve agricultural productivity and by extension the quality of vanilla. Growing vanilla requires new knowledge and correct information. Farmers need to be educated as to how much is involved in growing and curing vanilla. Piero Bianchessi's (2012) *Vanilla Agriculture and Curing Techniques Handbook* is a key resource used widely by established vanilla farmers and thus access to this vital resource is crucial.

Recommendation 2

Encourage farmers to practise intercropping in order to obtain short-term returns.

Commentary:

For many farmers, the length of time before they see any financial return may push them to abandon growing vanilla in favour of cash crops.

Recommendation 3

Strengthen relationships with key buyers/processors/exporters in order to build up

⁹ We thank the reviewer for suggesting this recommendation

market share as well as gain insight into market opportunities.

Commentary:

A theme that emerged from this study is that some farmers had limited access to market information. Consequently, they did not fully understand the value of vanilla in key markets. Similarly, they lacked pertinent insights into customer preferences, value-added processes and market structure. Thus, developing and strengthening relationships with buyer firms is crucial. According to McGregor and Stice (2014) “in successful value chains, agribusinesses ‘pull’ the product through the chain” p. 36) as opposed to being pushed by the growers. A key example is Heilala Vanilla in Tonga, which has identified market opportunities and is working closely with farmers to grow quality vanilla which then enters into their supply chain.

Develop a niche, premium product

Recommendation 4

Focus on developing premium-quality products and building brand awareness of the value of Pacific vanilla (premiumisation).

Commentary:

Increasingly, vanilla is recognised as a premium product and efforts should be undertaken to reflect this positioning in the market. There was the suggestion made that some farmers are focusing on increasing production to meet market demands at the expense of maintaining quality standards. This is a lesson that Madagascar and Uganda have learned at their expense.

Each of the countries at the centre of this study does not have the capacity or supply to compete in international markets with Madagascar and Indonesia on scale. Instead,

they should focus on producing a premium-quality product. Premiumisation is crucial for the “commercial viability of niche export markets from small remote locations” (McGregor & Stice, 2014, p. 36). There is scope to establish a regional presence of national niche brands, but, in order for this to occur, there needs to be a clear strategy for growth. When seeking to build a premium-quality brand, New Zealand can be a test market before further expansion into international markets. By developing a premium product, farmers may receive a reasonable return during prolonged periods of vanilla production.

Recommendation 5

Increased presence at key promotion events. For example, NIUE Vanilla International regularly attends food shows in New Zealand and Australia in order to build up brand recognition.

Commentary:

Increasingly, vanilla is recognised as a premium product and efforts should be undertaken to reflect this positioning in the market. Business-oriented trade fairs such as the Fine Foods NZ Trade Show and Australian Fine Food Show provide a cost-effective sales and marketing platform for Pacific agricultural exporters. Trade shows are also a space to gain insight on market trends and competitor offerings. For example, Venui Vanilla was able to capitalise on its participation in the Australian Fine Food Fairs by gaining insight into packaging, labels, prices and market requirements. Thus, repeat participation in New Zealand and Australian food shows is necessary for market exposure and positioning.

Recommendation 6

Greater availability of vanilla products for

sale in key tourist destinations in respective countries.

Commentary:

Tourists are an untapped potential for purchasing local products, which can be brought home (with few quarantine restrictions), and for promoting the quality and value of vanilla products. All three countries are key tourist destinations with tourism a key driver of economic activity. It is known that tourists want food and agricultural products that emphasise the

culture of a visited place. In making vanilla products available at key tourist locations, tourists will be able to purchase and take the vanilla back home, and potentially develop a market. There is the opportunity to develop a niche market promoting the “romance’ of the product’s origins” (PIFON, n.d., p. 3). This approach was used by Venui Vanilla—they firstly targeted Vanuatu’s tourist market before expanding into international markets (PIFON, n.d.).

9.2 Country-specific Recommendations

9.2.1 Cook Islands

In addition to the general recommendations, we recommend the following:

Access to markets

Recommendation 1

Collaborate with buyers/processors/exporters to develop a programme that focuses on training farmers on post-harvest production and processes.

Commentary:

According to McGregor and Stice (2014) less than 50 % of vanilla produced can be sold as beans in the retail market. The remaining beans require processing through value-added processes to access the market. More can be done to ensure farmers have knowledge of value-added processing. Vanilla value-added processes for creating extracts and pastes do not require intensive or sophisticated processes. Buyers/processors/exporters can provide finances and training through the programme to help farmers diversify their vanilla product range. A postharvest

programme could assist in developing a high-value niche non-perishable commodity.

Access to training

Recommendation 2

Obtain organic certification and train farmers in organic farming practices.

Commentary:

There is a growing demand for organic agricultural products such as vanilla. In addition, organic certification is considered vital to accessing markets and developing a premium vanilla brand. Premium-quality vanilla is imperative for the development and sustainability of the Cook Island vanilla sector, and organic certification is a vital component.

Recommendation 3

Invest in ongoing extension services that provide training and strengthen the links between growers and buyers/processors/exporters.

Commentary:

The role of extension services is invaluable in teaching farmers how to improve their productivity. Ongoing training is essential to the growth of the sector, and ensuring quality

standards are upheld during the curing process. In addition, extension services play a vital role in facilitating links between farmers and processors. Thus, we recommend that the government and development agencies invest in further extension services to provide ongoing training to local farmers.

9.2.3 Niue

Access to markets

Recommendation 1

NIOFA to help strengthen relationships with key actors including buyer firm in order facilitate vanilla products being pulled into the market by the private sector.

Commentary:

Our research shows that NIOFA's executive committee members are well-respected, experienced farmers and distinguished agricultural leaders. Their influence can be used to facilitate the interactions and relationship between private sector actors and vanilla growers. NIOFA's involvement in the process can empower farmers and strengthen communication amongst vanilla actors. By way of example, some participants in the field highlighted the issue of a lack of information sharing amongst farmers, government departments and exporters, which is not exclusively an issue for Niue's vanilla sector. However, this reveals a lack of effective communication channels and in some cases trust amongst players. Thus, encouraging NIOFA to play more of an active role in facilitating relationships in the vanilla sector will benefit farmers, exporters, and the government.

Access to training

Recommendation 2

Specific training on postharvest processing.

Commentary:

The training and upskilling to date has not focused, to a large extent, on the business side of the vanilla sector. Specific training on postharvest production and product diversification is required for the vanilla sector to transition to the next phase. Further, we recommend that the government and development agencies invest in a reprint, as noted in the general recommendations, of the Piero Bianchessi (2012) *Vanilla Agriculture and Curing Techniques Handbook* to help educate farmers on the growing and cultivation processes and establish quality-assurance measures (grading scheme).

Recommendation 3

Invest in extension services to provide ongoing support to farmers.

Commentary:

The delivery of information and input to farmers is an instrumental to the growth of the vanilla sector. Extension services allow agricultural experts to disseminate consistent information and ensure proper curing techniques are used for quality purposes. Our research shows that resourcing in the Department of Agriculture, Forestry and Fisheries is limited. We recommend that the government and development agencies invest in additional extension services.

9.2.3 Samoa

Access to market

Recommendation 1

Provide farmers with access to information on markets, prices and market requirements.

The thriving STEC vanilla plantations in Mulifanua are evidence of the commitment demonstrated by the government to invest in high-value-added crops (Strategy for the Development of Samoa 2017–2020). As mentioned, Samoa is very much in the early stages of vanilla production with Vaoala being a key player. Therefore, access to markets and participation in regional or global value chains is curbed by their initial level of capacity. In spite of this, the long-term prospects are promising, and access could occur once Samoa reaches full production including the facilitation of harvest, postharvest, and then exporting vanilla. Consequently, this recommendation would assist in the preparation of vanilla products for export.

Access to training

Recommendation 2

Invest in agricultural education to complement current training schemes provided by Vaoala and STEC

Commentary:

A specific agricultural education course could emphasise vanilla farming practices together with business planning such as “how to manage a vanilla farm.” A specialised vanilla training course would aim to prepare and support emerging and interested farmers with learning about vanilla growing alongside business management practices suitable to Fa’aSamoa and the Samoan context.

Co-ordination and collaboration

Recommendation 3

Strengthening business relationships and talanoa between farmers, NGOs and governments targets potential gaps in the value chain such as providing essential vanilla information.

Commentary:

The partnership collaboration between STEC and Vaoala promotes the exchange of skills and knowledge to enhance production. There were, however, a few farmers who did not know where to go for information regarding vanilla growing and the schemes and assistance available to support them. As such, the information flow that is necessary for strengthening small-farm holders with NGOs and government was limited. This recommendation is important to Samoa so those rural farmers can find out what they need to do and where to get assistance for vanilla growing.

Recommendation 4

Re-establishing the Vanilla Governance Committee.

Commentary:

This recommendation concerns one of the earlier vanilla initiatives that the government implemented—the Vanilla Governance Committee—made up of ministry officials, STEC, Vaoala Vanilla and other vanilla stakeholders. The committee intended to facilitate linkages between suppliers and markets and revitalise former vanilla farmers. Our talanoa with Samoan participants suggests that the commitment to the Vanilla Governance Committee has lapsed. The reestablishment of the committee as an ongoing plan and investment could further improve the vanilla environment with positive payoffs in the long term for Samoa.



Access to finance

Recommendation 5

Extend the reach of communicating available finance for vanilla growers so that the rural farmers who are outside the central city of Apia or live on the outer islands are informed of available access to finance.

With the introduction of vanilla as a new agricultural crop, the government implemented financial assistance through soft loans (from the Development Bank of Samoa) to help with purchasing equipment and other resources needed to grow vanilla. Therefore, access to finance (with criteria) for vanilla production is already established in Samoa. It is interesting, however, that a few farmers were unaware of these loans and therefore, did not have the financial support to start or maintain vanilla growing. Without finance (and training support) farmers could lose interest and withdraw from vanilla growing. As such, communicating the financial support through different mediums such as newspapers, television, community newsletters, and other appropriate means could attract interest from potential vanilla farmers to take up this offer.

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11. Appendices

Appendix 1: Main Vanilla Producing Countries

This section contains brief reviews of some of the main producing countries of vanilla.

11.1 China

Vanilla planifolia was first introduced in the early 1960s to the Chinese provinces of Hainan and then Yunnan¹⁰ (Zhou, Wang, Wang, & Chen, 2011). However, interest in vanilla surged when research institutions and the government dedicated projects to the development of vanilla in the late 1980s and early 1990s. At the time, the largest vanilla producer, with five plantations, belonged to the Yunnan Vanilla Industry Company.¹¹ Progress was minimal, and the sales of vanilla beans were confined to local Chinese markets. In addition, poor management, lack of capital support, vanilla disease and natural disasters (e.g., typhoons and droughts) wiped out many plantations (Landau, 1998; Zhou et al., 2011). In response, the government further assisted with new policies to encourage farmers with technical training and advice, and heavily invested capital in science and research institutions and universities to develop industrial cultivation of vanilla.

According to the FAOSTAT (2017), China is the third leading country in vanilla bean production, harvesting 662 tonnes of vanilla. Although this figure is small in comparison to Indonesia and Madagascar (2,402 and 3,227 tonnes respectively), it seems that the initiatives and substantial investments from the Chinese government in vanilla production

enhanced productivity and exports. Interestingly, Chinese investors in Madagascar control some of the supply routes directly back to Asia and receive large tax breaks from the Malagasy government (Al Jazeera, 2015). As the China economy continues to grow, production may be stalled as workers could demand higher incomes (Burton, 2018).

11.2 Indonesia

Vanilla is primarily grown in Bali and South Java although farmers have begun planting in Sumatra, Lombok and Flores. Indonesia's rise in the world's top producers coincides with the growth of vanilla production in many Asian countries such as China. There is some scepticism over Indonesia being ranked as the top producer; for example, Papua New Guinean MP John Simon believes that the premium vanilla produced by Papua New Guinea (ranked 2nd in quality by Aust and Hachmann 2018 May vanilla report) was being bought by Indonesia and sold as their own produced vanilla (Poriambep, 2018).

11.3 Madagascar

Historically, as the world's largest grower of vanilla, there is a direct relationship between vanilla yields in Madagascar and global prices. An estimated 97 % of the world's real Bourbon vanilla comes from Madagascar. The best quality Bourbon vanilla is grown primarily in the northwest of Madagascar in

¹⁰ Yunnan forms the part of Southern China that borders Myanmar and Laos. Hainan (island) is situated to the north of Vietnam and the Philippines. Both Yunnan and Hainan fall within the acceptable geographical band of vanilla production.

¹¹ Yunnan Vanilla Industry Co. was the biggest vanilla planting and production enterprise in China; it formed in 1997 and became bankrupt in 2007. (Zhou et al., 2011).

the Sambava, Antalaha, Vohemar and Andap (SAVA) districts (Nestlé, 2015).

In 1968, the government formed a vanilla cartel with nearby Comoros and Réunion. The market price for vanilla was set at such a price that buyers resorted to purchasing cheaper, inferior vanilla from other sources, such as Indonesia, as well as the low-cost option of synthetic vanilla. As a consequence, many Malagasy farmers switched to other crops. A decrease in demand for Madagascar vanilla weakened the cartel and resulted in the government ending the price-fixing regime.

The industry continued to experience highs and lows. Madagascar experienced a series of cyclones¹² and a civil war in the early 2000s resulting in a significant decline in vanilla production leading to rapidly escalating prices on the international market. At the end of 2002, vanilla prices were US\$200 per kg—around 10 times the market price just 3 years earlier. By 2004, the market price dropped back down to pre-2000s prices as large buyers of vanilla turned to cheaper alternatives, and synthetic vanilla became easier to source and produce. It was not until 2015 that there was a significant movement in market price. As at 2016, the vanilla market value reached US\$854 million, twice the level of 2015 and four times higher than that of 2007 (AgriOrbit, 2018).

In 2017, a cyclone hit Madagascar, again destroying crops, and thus vanilla prices increased to a record price of US\$600 per kg as there was uncertainty around vanilla production levels (Pilling, 2018).

Farmers continue to face other serious challenges including diseases and the long-term sustainability of the industry. High

prices have meant that the crops have become targeted by thieves, with farmers resorting to sleeping in plantations or hiring guards to protect their crop. Subsequently, some farmers have begun harvesting vanilla before it is fully ripe. This, however, lessens the quality of the bean (Gercama, 2018).

With the help of international buyers, programmes have been put in place to sustain and develop the industry. In 2010, Nestlé undertook an evaluation of the vanilla supply chain in Madagascar as the industry lacked traceability beyond the “exporter level” (Nestlé, 2018). Nestlé found that farmers had very little say in determining prices and thus farmers are the most vulnerable actors in the supply chain. Nestlé and other large buying companies including Unilever which have advocated for farmers to gain more training and, by extension, expertise, are setting a benchmark for other buyers to follow (Nestlé, 2015). A development programme with Malagasy farmers, initiated in 2010 by Givaudan (a Swiss manufacturing company) and their long-term partner Henri Fraise Fils et Cie, a vanilla bean exporter from Madagascar, aims to encourage the sustainable development of the vanilla industry through improvement in yields and quality (Givaudan, 2018) thereby ensuring a more sustainable price for vanilla. Other key buyers such as Mars, Danone and Firmenich launched a farming project in Madagascar (2016) to help sustain the market within Madagascar (Burrows, 2017). Firmenich CEO, Gilbert Ghostine, said that the aim is to ensure the very best for the environment, the livelihood of the farmers and the links between farmer, producers and buyers (Firmenich, 2015).

¹² Madagascar experiences on average about four cyclones per year. In March 2017, Cyclone Enawo hit

Madagascar destroying about 30 % of the vanilla crops.

11.4 Mexico

The use of vanilla in Mexico for culinary purposes can be traced back to pre-Hispanic times. It was originally used as an ingredient to prepare *xocolatl*¹³, a cocoa-based drink infused with *ixtlilxochitl*¹⁴, the pre-Hispanic name for vanilla. The first foreign exposure to vanilla came with the Spanish colonisation of Mexico—the Spaniards took the vanilla beans to Europe but were unsuccessful in their attempt to grow vanilla in Europe for more than three centuries, during which time Mexico remained the only vanilla producer (2000Agro, 2017). In 1841, Europeans developed a method whereby vanilla could be grown outside of Mexico.

Despite being the only producer for centuries, the vanilla industry in Mexico declined to the brink of extinction. Reasons for the decline include the exploration and exploitation of oil fields in the vanilla microclimate area; a lack of government incentives for non-strategic industries such as agribusiness; the lack of technology and R & D targeting vanilla cultivation; overexploitation and non-renovation of vanilla plantings (Soto Arenas, 2006); and climate change resulting in dryer and longer raining seasons (Plancarte & Rain, 2018; Torres Cruz, 2017).

In more recent years, vanilla farmers have received government incentives to increase production. In 2016, 1,059 hectares were cultivated, 58 % of which used sophisticated technology with the aim of ensuring plantation health, and 54 % has been developed with the assistance of technical experts.

The total production of vanilla in 2016 was 512 tons, of which 485 tons were consumed

domestically with the remaining production exported as a fresh unprocessed product. In 2016, exports were forecast to reach around 62 tons in 2018, and 151 tons by 2024. The top ten countries sourcing Mexican vanilla are the USA, France, the Philippines, Germany, UK, Belgium, Mauritius, Canada, India and Italy. The majority of these countries have no import tariffs—the Philippines, Mauritius, and India being the exception. The Mexican government is currently attempting to consolidate the North American market through NAFTA, and expanding vanilla exports to more countries in the European Union.

11.5 Turkey

There is little information available about vanilla production in Turkey. However, this country's position as the sixth leading producer first peaked in 2004 with 100 tonnes, then again in 2012 and 2017 (290 and 318 tonnes respectively) (FAOSTAT, 2017). These increases correspond with rising prices as the demand for vanilla grew in response to changing consumer preferences and reduced supply due to damaged stock from Madagascar.

11.6 Uganda

In 2018, Opolot Okasai of Uganda's Agriculture Ministry is quoted as saying "Vanilla is an important crop and the government is promoting its quality and boosting security in growing areas" (Ojama & Hill, 2018). This is key as government support is important to the growth of the industry. Uganda faces a similar problem to Madagascar; farmers are concerned about the security of their crops and have hired guards in order to deter thieves (Willis, 2004).

¹³ Xocolatl, a Nahuatl (Aztec) word from which the term chocolate is derived

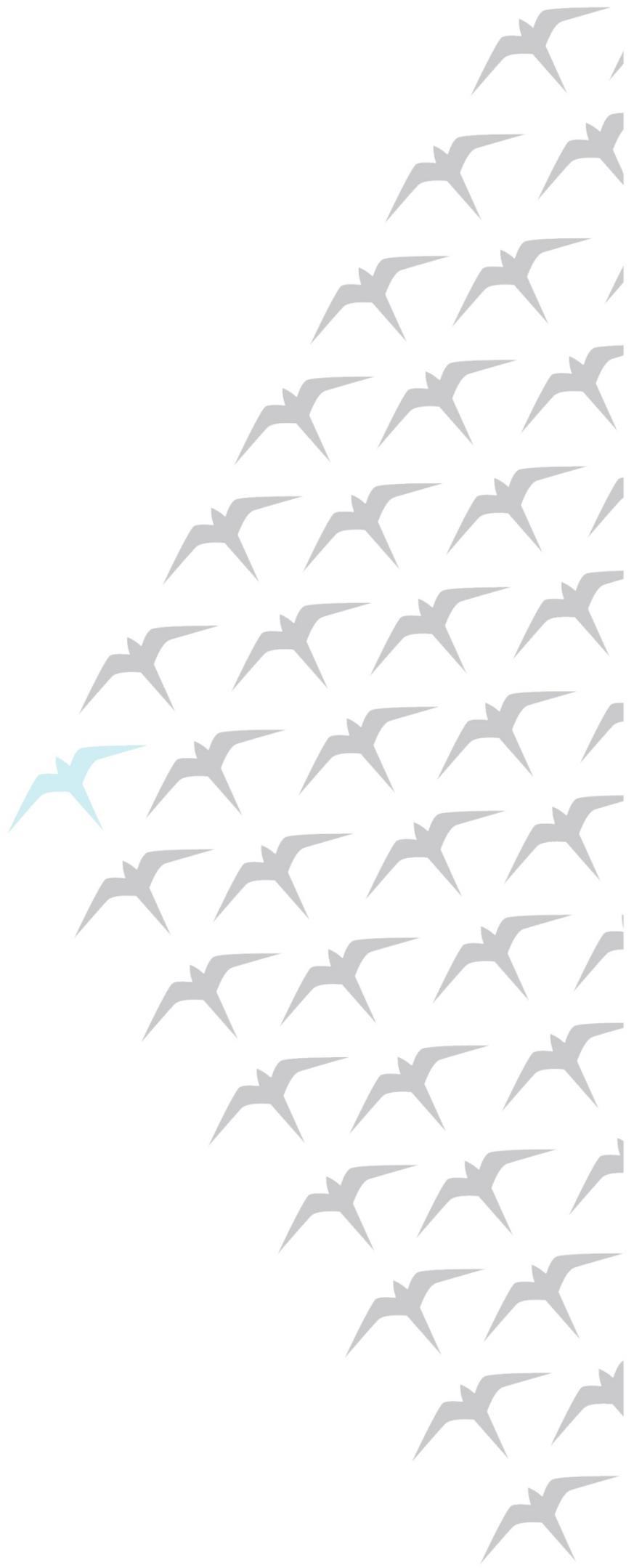
¹⁴ Ixtlilxochitl or tlilxochitl, means "black flower" in Nahuatl (Aztec)

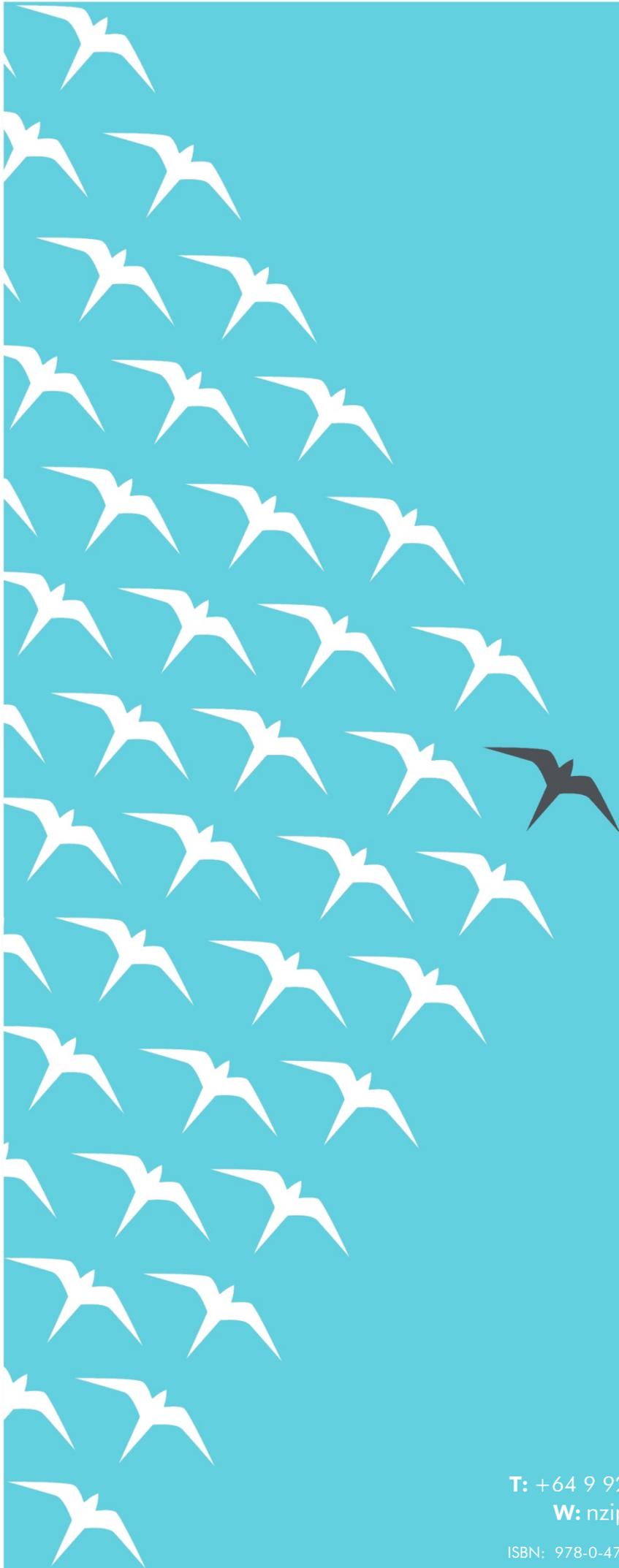
It is estimated that Uganda will produce around 100 tonnes in 2018 with the potential to produce more in the near future (Ojama & Hill, 2018). The Ugandan Export Promotion Board reported that in the half decade to 2016 annual shipments increased from 0.65 tonnes to 75.4 tonnes (Ojama & Hill, 2018). There was,

however, a decrease in volume in 2014 as a result of the global vanilla price dropping, causing farmers to abandon the crop. Although the production level is nowhere near the output of Madagascar, it will ease buyers' reliance on sourcing the same variety from a single location (Madagascar).

Appendix 2: Historical timeline of key historical vanilla events

Year	Global Events
1800s– 1890s	<p>1827—Vanilla introduced to Tonga.</p> <p>1836—Belgian Charles Morren identified how to hand-pollinate the flowers.</p> <p>1841—Edmond Albius, an enslaved worker on Réunion, developed a more effective hand-pollination method.</p> <p>1846—The Dutch grew vanilla in the Dutch East Indies (now Indonesia).</p> <p>1850—Mexico dominated the vanilla trade.</p> <p>1858—Vanillin—the active flavour ingredient of vanilla—was isolated for the first time.</p> <p>1874—Vanilla substitute produced from the juice of the pine-tree.</p> <p>1891—Synthetic vanilla produced from clove oil, wood pulp, sassafras oil and coal tar.</p> <p>1898—Vanilla introduced to Madagascar following colonisation by the French.</p>
1900– 1949	<p>1900—Fiji a major world producer of vanilla. French Polynesia producing vanilla and a small market for vanilla begins in Tahiti.</p> <p>1905—Synthetic vanillin gains global distribution resulting in a collapse of the Fijian industry</p> <p>1942—Tahiti vanilla (<i>tahitensis</i>) first introduced to the Cook Islands.</p>
1950— 1999	<p>1965—Vanilla introduced to Papua New Guinea (from Madagascar).</p> <p>1970—Tongan vanilla esteemed as equal to Madagascar vanilla, therefore best in the world</p> <p>1989—Indonesia ranked as the leading vanilla producer</p> <p>1990—Cyclones in Madagascar destroy vanilla vines</p> <p>1995—World price at US\$15 per kg</p> <p>1997—Tahitian government increases vanilla production</p> <p>1999—World price at US\$50 per kg</p>
2000– 2015	<p>2000—Cyclones and civil war in Madagascar mean vanilla production destroyed and/or halted. World price for vanilla US\$200 per kg by the end of 2000.</p> <p>2002—World price at US\$300 per kg.</p> <p>2003—World price increases to US\$500 per kg. World vanilla demand falls by 35 %. Papua New Guinea 3rd largest vanilla exporter. At the peak of vanilla prices, there were 50,000 vanilla farmers in PNG, however, with the collapse of the market, growers left the industry.</p> <p>2004—Contraction of the vanilla market.</p> <p>2011—World price at US\$40 per kg</p> <p>2013—Indonesia recorded as the world’s largest vanilla grower, producing 3,200 tonnes, followed by Madagascar, 3,100 tonnes (United Nations Food and Agriculture).</p> <p>2015—Vanuatu—Cyclone Pam destroys vanilla production. Leading global manufacturing companies—Unilever, Hershey’s, Kellogg’s, Nestlé and General Foods—plan to eliminate artificial flavours and other additives from many foods sold in the United States in favour of natural ingredients, e.g., natural vanilla instead of synthetic vanillin. World price increases from US\$100 to US\$225 per kg mid-year due to poor harvest and speculative harvesting in Madagascar. Other factors combined to exacerbate price increases in 2015 include falling stocks, increased demand, and heightened consumer preferences for natural ingredients (Sims, 2016; Terazono, 2017).</p>
2016	No significant events occurred.
2017	<p>Cyclone Enawo in Madagascar destroyed 30 % of vanilla crops.</p> <p>Global price reached US\$600 per kg while in Tonga vanilla reaches record price of \$US139 per kg (Source: https://www.radionz.co.nz/international/pacific-news/335335/tongan-vanilla-reaches-record-price)</p>
2018	<p>Global price reaches US\$700 per kg, vanilla is now more expensive than silver at US\$550 per kg.</p> <p>Uganda (ranked 7th) is seeking to boost vanilla production with government promoting vanilla quality and increased security for vanilla farmers (Ojambo & Hill, 2018).</p>





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