PROSPECTS FOR VANILLA AGRIBUSINESS DEVELOPMENT IN ERMERA AND MANUFAHI, TIMOR LESTE

by

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Prospects for Vanilla Agribusiness Development in Ermera and Manufahi, Timor Leste

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1. Introduction

The economy of Timor Leste is largely dependent on the agriculture sector which makes up about one third of the nation's GDP. Around 80 per cent of the population of Timor Leste is engaged in agriculture related work. It is therefore necessary that serious attention be given to this sector, including the export commodity, coffee, and other crops with export potential such as vanilla, cacao, as a means of accelerating agricultural development especially in rural areas.

From the time of the Portuguese, through the Indonesian occupation, and up to the present, coffee has been Timor Leste's main export. In fact, about 90 per cent of the country's export revenue is derived from coffee. Between 1987 and 1990, coffee exports have contributed some US$12.5 million to the country's foreign exchange earnings (Costa & Saldanha 1999).

The fluctuation in the price of coffee in the world market affects the incomes of the Timorese coffee farmers and this impact is becoming more severe. Coffee production in Timor Lester is based on a relatively unmanaged system with little attention given to plantation management and to pest and weed control (Amaral 2001). In addition, the common shade tree *Paraserianthes falcataria* has been infected by gall rust (Cristovao 2001) which is now common over all production areas with consequent impact on the quantity and quality of coffee production. In an effort to lessen the dependency of Timor Leste on coffee as its main export and to reduce risk to farmers' income due to their dependency on coffee as their main source of income, the government and some international NGOs have introduced vanilla to the nation's 13 districts. A preliminary survey conducted by the National Cooperative Business Association (NCBA) in these districts has shown that, aside from the local farmers' interest in growing this commodity, the soil type and climate are suitable for growing vanilla. The CCT Report of 2005 had revealed that during the year, 28 farmer groups (with a total of 877 members) have already started to grow vanilla. Furthermore, the total area planted to it had already reached 224 hectares while planting had spread to ten (10) districts. In addition, the total export of vanilla likewise increased. For instance, total vanilla exports went up from 750 kilograms in 2002 to 1500 kilograms in 2004 (CCT 2005a). The growth of vanilla production in Timor Leste from 1989 – 1991 and from 2002 – 2004 is shown in Table 1.

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Table 1: Vanilla production in East Timor, 1989 – 2004

Year	Production (ton)
1989	0.61
1990	7.11
1991	4.10
2002	0.75
2003	1.00
2004	1.50

Source: BKPMD (1992) & CCT (2005a)

The table shows that while vanilla production had been erratic from 1989 to 1991, the three years, 2002 to 2004, saw a gradual increase from 0.75 ton up to 1.50 tons. This is partly a reflection of the support given by the government as a move towards diversification to avoid total dependency on coffee (MAFF 2004). The number of farmers involved in growing vanilla in Timor Leste is about 877 farmers with a total area of 224 ha as shown in Table 2.

Table 2: Total vanilla farmers, total farmer groups, and total area of vanilla in East Timor, 2005

District	Total farmers	Total groups	Total area (ha)
Ermera	355	11	81.53
Liquica	332	8	95.99
Aileu	38	2	9.13
Same	58	2	9.27
Baucau	5	1	2.60
Lospalos	2	1	1.50
Bobonaro	77	1	20.81
Ainaro	9	1	2.54
Manatuto	1	1	0.50
Total	*877*	*28*	*224.00*

Source: CCT (2005a)

Vanilla (*vanilla planifolia* Andrews or *Vanilla fragrans* Ames) has its origin in Central America, particularly Mexico, and was first used by Aztec Indians as a flavoring in chocolate drinks. Today, vanilla is the number one natural flavoring for ice cream, frozen deserts and candy and it is almost certainly the number one flavoring in the world (Silva 1993 in CCT 2005a). It is also used in the manufacture of perfumes. Vanilla's special value is due to its essence of "vanillin" and its other aromatic components.

Vanilla, a member of the Orchidacea family, is planted in countries that are situated between latitudes 20° north and south of the equator in Mexico, Madagascar, Ceylon, Indonesia and Fiji archipelago (Reismunandar & Sukma 2002).

Vanilla is a difficult crop to cultivate, maintain and process correctly. Thus it requires a great deal of experience and skill for successful production and processing. As well, vanilla essence can also be produced synthetically. Production of the synthetic vanilla has made a large dent in the demand for the natural product resulting in the constant fluctuation in prices of the essence in the market. However, the natural vanilla product is still generally preferred by many consumers.

To date, however, there is a lack of studies on the economic feasibility of vanilla production in East Timor. If the aim of the government is to encourage farmers to take up vanilla production, then information on the costs and benefits, market availability and overall prospects for vanilla production should be forthcoming. In response to this and to support the introduction of the development of vanilla in East Timor, this study, which deals with the prospects for vanilla agribusiness development in selected areas in East Timor, was conceptualised.

2. Objectives

The general objective of this study was to determine the feasibility of vanilla production as an agribusiness enterprise in selected areas in East Timor. The specific objectives of this study were to:

- Identify the agronomic feasibility of vanilla production in East Timor;
- Estimate the costs and returns for vanilla production; and
- Examine markets for vanilla in East Timor.

3. Research method

The sites chosen for the study were in the districts of Ermera and Manufahi, both recognized as potential areas for growing vanilla. The activities involved a literature review, interviews with farmers and market intermediaries and economic (costs and returns) analysis.

The sample for this study included farmers and their households, community leaders, people from government agencies, CCT/NCBA, local and international NGOs and businesses.

The survey was conducted on 104 farming households which made up 25 per cent of the total vanilla households in Ermera and Manufahi. The data collected included climate, prices, vanilla production practices, production costs, current and potential markets. The questionnaire was written in Bahasa Indonesia and used language appropriate to the farmers. The questionnaire was pre-tested and revised to include aspects which had been overlooked such as the cost of manual pollination and to standardize measures such as sacks used to describe measurements of inputs and outputs. The duration of data collection was three months, from May to August 2005.

Descriptive analysis and economic (cost and returns) analysis of the data were conducted using the computer softwares, SPSS and Microsoft Excel.

4. Description of study areas

4.1. Ermera

Ermera District is one of the 13 districts of East Timor. It is demographically located at 8° 40-100' south latitude and 125° 01-35' east longitude. The total area of Ermera is about 746 square kilometers. It consists of five sub-districts namely Atsabe, Letefoho, Hatolia, Ermera, and Railako. Topographically, Ermera is divided into four areas according to altitude: 1) areas with altitude of 40–100 m including Hatolia, Sare, and Marobo River; 2) areas with 100–500 m altitude in Hatolia town; 3) areas with 500–1000 m altitude including Tallo, Fatubesi, Ermera and Railako; and 4) areas with more than 1000 m altitude including Atsabe and Letefoho.

Based on the 2004 census, the total population of Ermera was around 103 169 people with a total of about 21 028 households (Graven & Neupert 2004). In addition, the total household that worked in the agricultural sector had declined from 15 055 in 1991 to 11 066 in 1995 (Bappeda 1997).

The climate in Ermera is classified under the category of "wet" or Type C (BPS Ermera District, 1995) with an average annual rainfall of 1000–3000 mm per year, and an average distribution of six months wet and four months dry and two months humid. The maximum rainfall occurs in December and January, while the minimum rainfall occurs in July (Bappedat 1998).

Ermera is the center of coffee production in Timor Leste with a total area of about 34,909 hectares planted to coffee which comprises 63 per cent of the total coffee area in East Timor. In addition, 70 per cent of coffee in Timor Leste is produced from Ermera. The production of coffee in 1993 was 5500 tons; in 1994 was 5400 tons; and in 1995 was around 6000 tons (BKPMD 1995). Aside from coffee, there were also other crops that farmers were engaged in including food crops and horticultural crops such as rice, maize, cassava, soybean, potatoes, tomato, cabbage and other crops.

4.2. Manufahi

Administratively, Manufahi district is divided into four sub-districts, Manufahi's northern part consists of upland areas surrounded by mountains, and its southern part consists of a huge area of lowland where most of the Manufahi farmers plant food crops. The total area of Manufahi is about 1324.91 sq km or 9.7 per cent of the total area of East Timor.

The total population in Manufahi was 44 235 people. The total number of households was about 8704 (Graven & Neupert 2004).

Manufahi district has two distinct seasons; the wet and the dry season. The dry season is only about three months (August - October), while the wet season is about nine months (November - July). The temperature is around 23.3-27.5 ^{0}C with an average of 25.7 ^{0}C. The humidity is around 67.8-81.2 per cent with an average of 76.4 per cent.

The main agricultural production of farmers included plantation crops and horticultural crops. Farmers who live in upland areas depended on the production of plantation crops such as coffee, candlenut, etc. Those in lowland areas such as Betano area, Dotic, Besusu, and Queiras grew a variety of crops and horticulture crops.

Livestock produced in the area included cattle, horse, buffalo, and small animals such as goat, sheep, pigs and poultry.

The map of the study sites is shown in Figure 1.

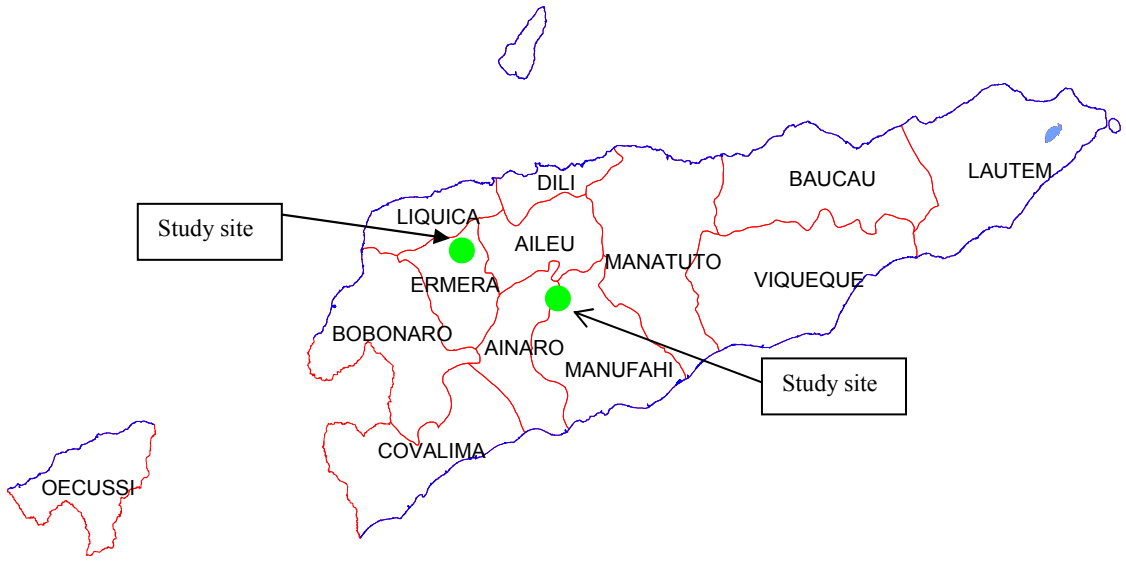


Figure 1. Map of the Study Site

5. Results and discussion

5.1 General description

The distribution of respondents according to location is as follows. About 92.5 per cent of respondents live in Hatulia and Fatubesi, Ermera and 7.5 per cent in Clacuc, Manufahi. More respondents were chosen from Ermera as it is the main vanilla growing area in East Timor. Manufahi, on the other hand is a new and targeted area for vanilla development, hence only a small number of farmers have started to plant vanilla in this area.

The average age of the respondents was 39 years old, the youngest being 17 and the oldest 74 years old. The overall gender distribution of respondents was 93.5 per cent male and 6.5 per cent female, and the average household size was about 7.4 members.

Apart from vanilla, farmers from the two districts produced other crops in their own land as well. These are shown in Table 3 below.

Table 3: Other crops grown in the study areas

Crops	Percentage (%)
Rice	12.1
Maize	76.6
Cassava	96.3
Beans	62.6
Others	80.4

As can be seen from the table, apart from vanilla, maize (77 %) and cassava (96 %) are also grown by respondents. Both cassava and maize grow well in the area as the climate and soil conditions are also suitable for these crops.

5.2 Vanilla production

The results of this study show that about 97 per cent of respondents say they grow vanilla in areas that range between 0.20-3 ha. In all, around 65 per cent or the majority of the farmers have an average of 0.50 ha planted to vanilla (Figure 2).

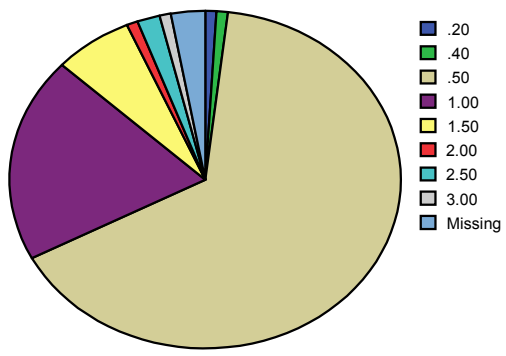


Figure 2: Area planted to vanilla

About half of the total number of respondents (50.5 %) had three years experience in growing vanilla while 7.5 per cent had less than one year experience (Figure 3). This indicates that most of the respondents in the survey are familiar with vanilla production, from planting to harvesting.

About 84 per cent of those with experience in vanilla production said that they want to extend their vanilla farms because the price of vanilla is high and that there is still available land for growing the plant (Figure 4).

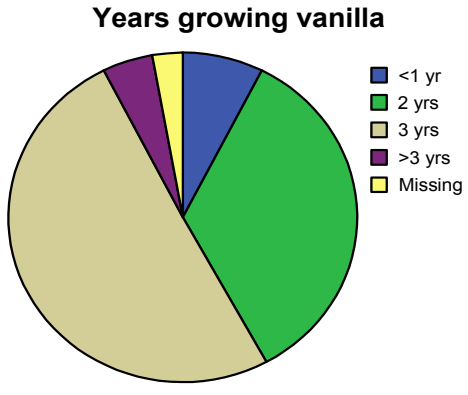


Figure 3. Years growing vanilla

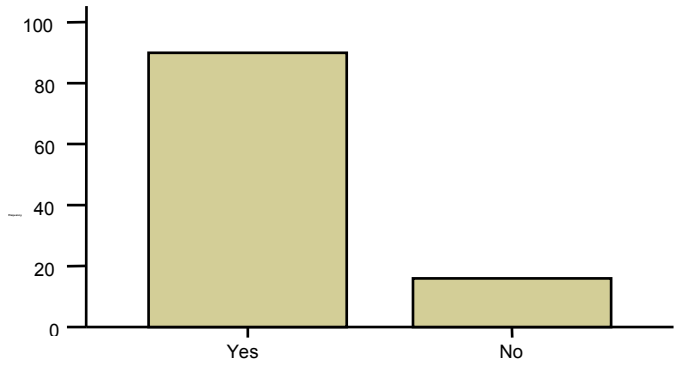


Figure 4. Plan to extend vanilla farm

Respondents have an increasing interest in extending vanilla production, spurred by the promise that it provides a higher income compared to that experienced by sole coffee growers. Only about 15 per cent of the respondents did not venture into vanilla farming for reasons of lack of labor force and the absence of irrigation water. While most farmers are interested in engaging in vanilla farming; however, the uncertaintty of water throughout the year makes some farmers less eager to engage in this activity, particularly in Manufahi district.

With regards to input use, only about 21 per cent of respondents, used fertilisers for their vanilla farms (Figure 5). The fertilisers used are inorganic such as manure and composts. The majority of the expenses of farmers go to labor. Most of the labor costs were spent on activities such as watering, planting, hand pollination and clearing. Less was spent for marketing and fertiliser application (Table 4).

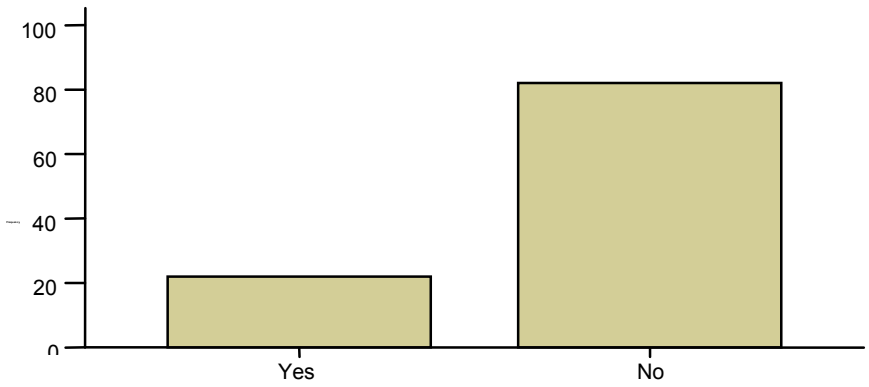


Figure 5. Use of fertiliser to increase vanilla production

Table 4: Average cost of labor in vanilla production in Ermera and Manufahi

Activities	Costs ($/ ha)
Land preparation	9.10
Clearing	13.13
Second harrowing	10.67
Bed preparation	16.76
Seeding in Nursery	1.06
Planting	10.50
Fertilizing	9.00
Wedding	10.38
Trellising	33.63
Watering	23.60
Pesticide application	25.00
Harvesting	12.10
Transporting	7.00
Marketing	4.28
Hand pollination	24.75

5.2.1 Vanilla production and disposal

The total area harvested was about 42.75 ha with a total output of 1860 kg for the sample farms. The product was sold to the market at an average price of US$22.50/kg[7]. The average production was about 49.8 kg/ha wet, showing that the productivity of vanilla in the farms surveyed is low. The low production in the area is due to lack of water and poor farm management practices resulting from lack of knowledge on vanilla production.

[7] The price of vanilla has subsequently decreased and is currently US$5/kg in Timor Leste for high quality certified organic vanilla.

The summary of production and sale of vanilla by the respondents is shown in the table below (Table 5). The total money invested by farmers in their vanilla farms ranges between US$100–$1000.

Table 5: Summary of vanilla production and disposal

Item	Amount
Total area harvested (ha)	42.5
Average area (ha/ farm)	0.5
Yield (kg/ ha)	49.8
Average output (kg/ farm)	39.4
Average price ($/ kg)	22.50
Total value production ($)	$47,510
Average returns/ farm ($/farm)	$886.46
Ave returns/ ha ($/ ha)	$1120.50

About 85 per cent of respondents do not have access to drying facilities, and only 15 per cent can access these.

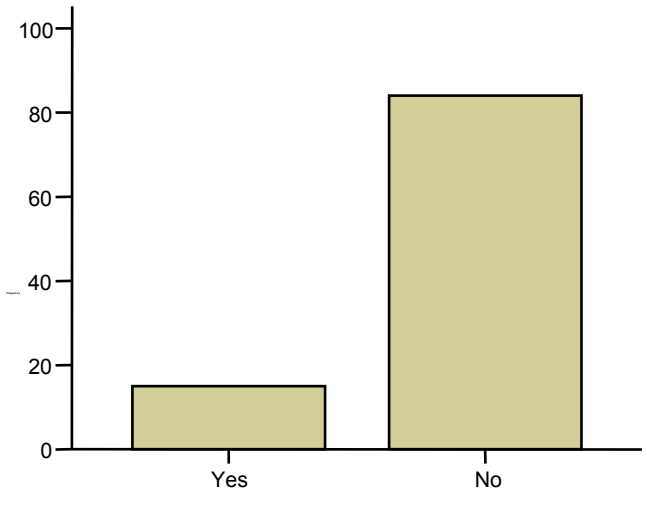


Figure 6. Drying facilities for vanilla

The lack of drying facilities and technical assistance on the drying and fermentation of vanilla have a severe effect on farmers' ability to fetch a higher price for their product. For example, the majority of farmers can only sell wet vanilla which has a lower price compared to dry vanilla. However, drying and fermenting vanilla is not an easy process and requires specific skills, the proper equipment, and hence extra costs, so that the quality of vanilla can be maintained. For instance, it is not easy to maintain the water content of 18 to 20 per cent of vanilla if proper standards are not met; hence vanilla is often processed by a cooperative rather than by individual farmers.

5.3 Agronomic feasibility

Vanilla originated in areas of dense forest in regions of high rainfall and humidity. The vanilla plant, while resistant to pest and diseases, needs a suitable environment for fertilisation to take place and to produce high quality fruit. The key environmental factors are climate (sun, rainfall, wind, and temperature), soil (particularly soil water availability), altitude and the availability of irrigation. Suitable climatic conditions for vanilla production is shown in Table 6.

Table 6: Climatic conditions required for vanilla plant to grow well

Suitability	Altitude (m)	Radiation (%)	Climate				
			Rainfall (mm)	Daily rainfall	Wet months	Dry months	Temp (°C)
Very suitable	< 800	35 - 45	1500 - 2000	80 – 178	> 9	< 2	20
Suitable	< 1200	45 - 50	2000 - 3000	80	5 - 6	< 2	9 - 38
Not suitable	> 1200	30	> 3000	> 178	3 - 4	2 - 3	> 38

Source: Balitro, 1989

As shown in Table 6, vanilla grows well in areas with about 1500 - 3000 mm of rainfall and at altitudes of < 800 to < 1200 m from sea level. The altitude of Ermera is 1000 - 1200 m, while that in Manufahi is 500-800 m above sea level; with an average rainfall of 1500 - 2000 mm for Ermera and 1000 - 15000 mm for Manufahi (Table 7). This shows that in terms of rainfall and altitude, both areas appear to be suitable for vanilla production. Similarly, temperature-wise, both Ermera and Manufahi are suitable for vanilla production.

Table 7: Climatic conditions in Ermera and Manufahi

Location	Altitude (m)	Radiation (%)	Climate				
			Rainfall (mm)	Daily rainfall	Wet months	Dry months	Average temp (°C)
Ermera	1000-1200	-	1500 - 2000	80 – 150	7 - 8	4 - 5	20 - 24
Manufahi	500-800	-	1000-1500	50 - 130	6 - 7	5 - 6	22 - 26

Source: Keefer, 2000

Vanilla can grow well in clay soils that contain enough mulch, water and soil nutrient and has good drainage. In some places, vanilla is generally planted in “clayey sand” soils. In addition, it is recommended that vanilla be planted in sloping land or in lowland that are not subject to water logging (Table 8). If the land is not sloping, drainage trenches need to be dug.

Table 8: Soil condition requirements for growing vanilla

Suitability	Soil		
	Texture	**drainage**	**pH**
Very suitable	Clay	Good	Neutral
Suitable	Clay & sandy	Quite good	Neutral to slightly acidic
Not suitable	Others	Obstructed	Very acidic/alkaline

Source: Balitro, 1989

Table 9 outlines the soil condition in Ermera and Manufahi. As shown in the table, soil texture in both locations meet the suitability criteria of clay and sandy soils. The drainage was described as good in both areas, hence meets the drainage requirements. The same is true with the pH (neutral to little acid). It appears, therefore, that Ermera and Manufahi seem to be agronomically suitable for vanilla growing.

Table 9: Soil condition in Ermera and Manufahi

Location	Soil		
	Texture	**Drainage**	**pH**
Ermera	Clay	Good	Neutral
Manufahi	Clay & sandy	Good	Neutral to little acid

According to Pulseglove (1991) in Reismunandar & Sukma (2002), the expected yield of one hectare of vanilla plant is about 2500-4000 kg of wet beans. This would produce 500-800 kg dry vanilla fruit after processing. Currently, the average yield is only close to 50 kg of wet vanilla. This is much lower than the potential yield levels mentioned by Reismunandar and Sukma (2004). Current levels can be improved with appropriate amount of inputs and with proper management.

Correl (1997) in Reismunandar & Sukma (2002) showed that the productivity of vanilla plants is influenced by planting density as shown in Table 10.

Table 10: Vanilla production forecast based on planting distance

Planting distance	Total plant/ha	Yield per ha (kg/ha)
2.74 m	1326	583
1.50 m	2150	946
1.20 m	3360	1478
1.00 m	5000	2200

Source: Reismunandar & Sukma (2002)

For a small farm, multiple cropping system can provide extra income, reduce the risk of crop failure and will ensure the continuity of the land in production while vanilla reaches a productive age of 10

years. In the case of small traditional farms, it is better to use lower planting density so that staple crops can be intercropped.

5.4 Costs and returns of vanilla production

When planting vanilla, the main establishment costs involves seeds, labour costs and implements needed for land preparation and crop establishment. Once the crop is established, the vanilla plant is productive for about 10 years. Operating costs include, organic fertilisers, manure, and labour, with labour making up the highest variable costs in vanilla production.

A cost and returns analysis was conducted for the production levels in the area and the results are shown below (Table 11). As shown in the table, the average returns from vanilla production in the study site is about $1120, while the expenses are about $293, giving a net revenue of about $827 per ha. This shows that vanilla production is profitable using the market price and yield levels at the time of the study, with a profit-cost ratio (R/C) of about 283%.

Table 11: Costs and returns analysis (per ha)

Items	Cost/ha ($/ ha)
Returns	
Vanilla beans (49.8 kg x $22.50)	1120.50
Total returns	*1120.50*
Costs	
Organic fertilizer	44.49
Manure	9.32
Labour	218.21
Others	20.83
Total costs	*292.85*
Net revenue (Profit)	**$ 827.65**

Since the time of the data gathering, however, the price of vanilla has fallen down sharply. Hence, an analysis was also conducted using the production levels in the area but using the current price of vanilla at $5.

The cost and return analysis showed that at the current price of vanilla and the average yield, then the returns decreases to $249/ ha which is lower than the cost of production ($293). Hence, farmers would have lost $43.5 per ha if the current price levels were used in the calculation.

As discussed in Section 5.3, potential yield levels of vanilla under ideal conditions could range between 2500 - 4000 kg. Using the expected yield levels for different planting densities summarised in Table 10 above, a further analysis was conducted to determine the potential net revenue for

vanilla for different scenarios. The first scenario represents the average farm yield in the area using the price of vanilla during the survey period ($22.5/kg). Scenario 2 represents actual yield and the current price of $5. Scenarios 3-6 represent yield levels under various planting densities at the current vanilla price of $5. The results of the analyses are summarised in Table 12.

Table 12: Cost and returns analysis under different scenarios

Scenario	Yield per ha (kg/ha)	Price ($/kg)	Revenue ($/ ha)	Cost ($/ ha)	Net revenue ($/ha)	R/C (%)
1 – Actual yield; survey (2005) prices	49.8	22.5	1120.5	292.5	828.0	283
2 - Actual yield; current (2008) prices	49.8	5	249.0	292.5	-43.5	-14
3 – Planting density of 1326	583	5	2915.0	292.5	2622.5	897
4 – Planting density of 2150	946	5	4730.0	292.5	4437.5	1517
5 – Planting density of 3360	1478	5	7390.0	292.5	7097.5	2426
6 – Planting density of 5000	2200	5	11000.0	292.5	10707.5	3661

As can be seen from the table, the net revenue when planting density is 1326 plants/ ha is expected to be about $2.6k, representing a R/C ratio of about 897%. At the highest density, net revenue can potentially reach over $10k per ha.

A change in farm management practices, may alter the cost structure. Similarly, it is possible that costs could have risen since the survey period. Hence, a further simulation was conducted simulating a 50% increase in costs. Net revenues were calculated using different planting densities, and the results plotted with the baseline scenario (using average costs during the survey of $292) (Figure 7).

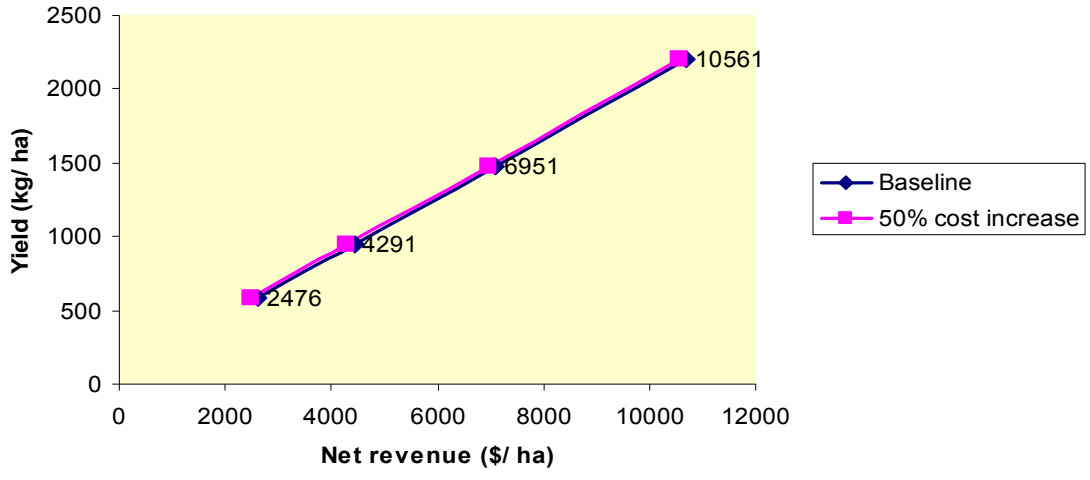
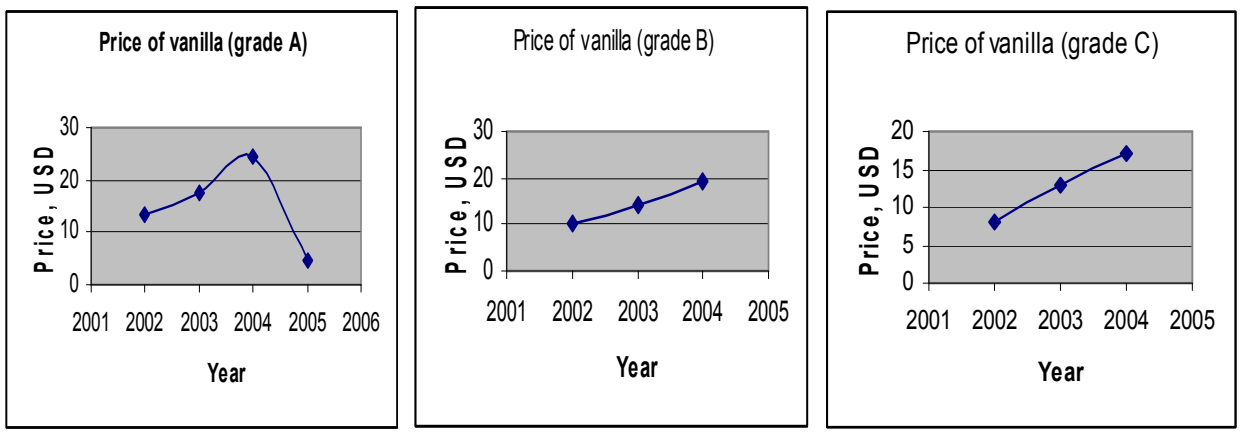


Figure 7. Comparison of net revenues for the baseline scenario and costs increase

The analysis showed that even when costs increase by 50%, revenue will still remain positive under all the planting densities. The net revenues expected ranges from $2476 - $10561 per ha, showing that, from an economic point of view, vanilla can be a profitable enterprise, particularly if grown under appropriate conditions and management practices.

5.5 Marketing

Most of the respondents sold their vanilla mainly to CCT/NCBA as well as to the Dili market and shops at an average price of US$22.5 per kilogram. Because there was only one major buyer of vanilla, CCT/NCBA in Timor Leste, farmers do not have a strong bargaining position. The figures below show the price of vanilla in Timor Leste in recent years (Figure 8).



Source: CCT, 2005

Figure 8. Price of vanilla (wet) in Timor Leste from 2002 – 2005

From 2002–2004, the price of vanilla steadily went up. This motivated the farmers to grow vanilla, and in some cases coffee growers started shifting to vanilla. In Hatulia, Ermera for instance, some farmers had started to cut down their coffee trees and began planting vanilla. This looked promising at the time and farmers considered moving away from coffee as the main source of income and look for other commodities such as vanilla which offered a better price. However, in 2005, the price of vanilla dropped sharply. This has suddenly put future attempts to build up the introduction of vanilla in Timor Leste in jeopardy.

Farmers normally sold their vanilla soon after harvest. This was because of the urgent need for cash for the family and becase some buyers only purchased wet vanilla. The farmers feared that delaying the selling of the wet beans might cause damage to the produce thus reducing their quality (and thus impacting on the selling price). Hence farmers felt that there was no need for storage but rather, they had to sell the product right after the beans are harvested.

When selling their produce, about 94 per cent of the farmers used their own transport or walked, two per cent used public transportation and about four per cent used other means.

There are two distinct distribution channels for vanilla in Timor Leste as shown in Figure 9. As mentioned above, most farmers sold their vanilla directly to CCT/ NCBA. Some farmers however sold their products first to local traders, who then either sold to the Dili market or to CCT.

About 98 per cent of the respondents said that they sold their own vanilla, while two per cent said they had buyers come to the village.

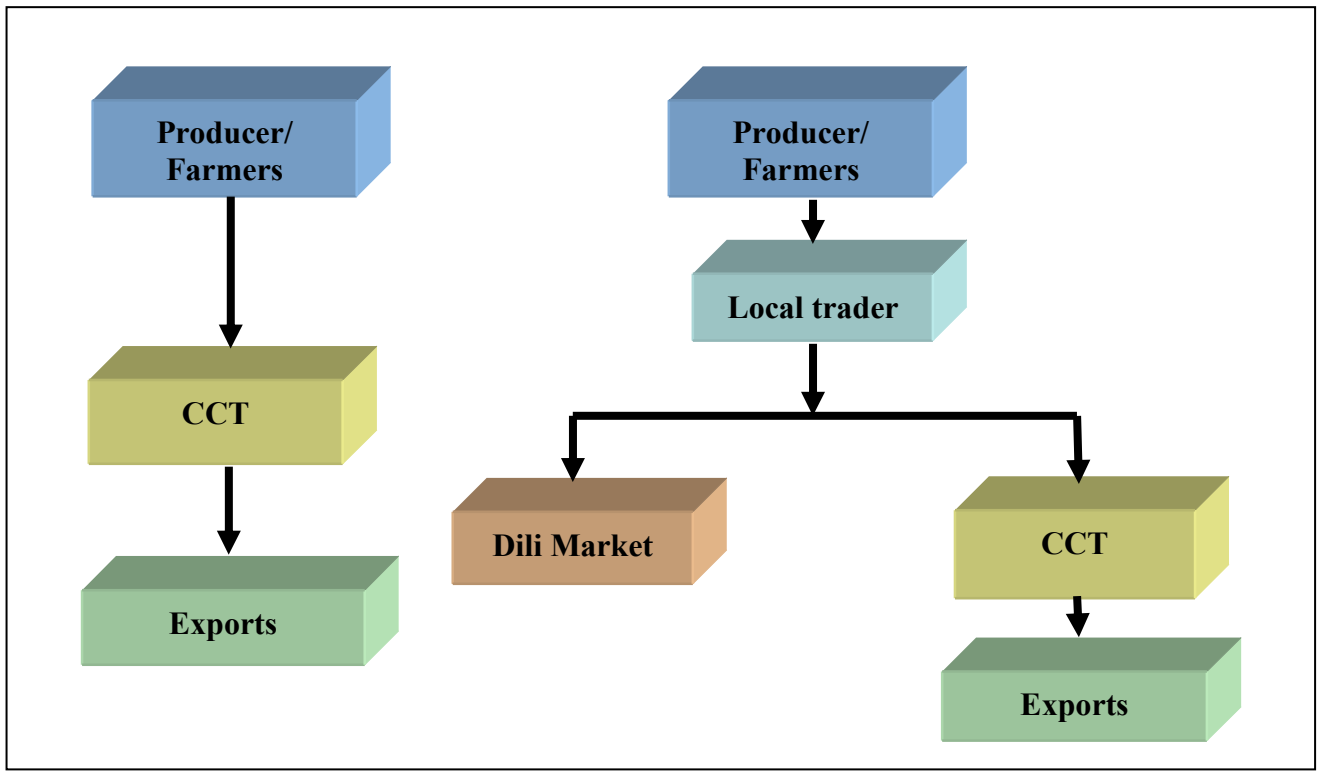


Figure 9: Distribution channels for vanilla in Ermera and Manufahi

When asked about where they normally obtained information on the price of vanilla, about 91 per cent of respondents said that they obtained information from their family and friends. A mere five per cent got their information from buyers while the lowest or two per cent obtained their prices from the radio and a further two per cent from other sources. This means that family and friends remain the most important source when seeking information, particularly about prices. Other respondents said that it is difficult to get information from other sources such as newspapers, radio, television and others.

5.6 Incentives for increasing vanilla production

Farmers were asked what is needed to increase their vanilla production. Of the respondents, 76 per cent indicated that higher price was a very important incentive while 30 per cent were of the opinion that stable price was a very important incentive for increasing vanilla production (Table 13). Cheaper transportation cost and lower input costs were rated as least important considerations for farmers when deciding to expand their vanilla production.

Table 13: Factors that influenced farmers decision to increase vanilla production

Factors	%				Mean score
	1	2	3	4	
Higher price (%)	7.3	16.4	-	76.4	3.69
Stable prices (%)	3.6	14.5	52.7	29.1	3.07
Better quality seeds (%)	5.5	50.9	25.5	18.2	2.56
Storage facilities (%)	63.0	18.5	3.7	14.8	1.70
Cheaper transportation cost (%)	58.2	25.5	12.7	3.6	1.62
Cheaper inputs (%)	77.8	14.8	5.6	1.9	1.21

1= not important at all; 2=moderately important; 3=important; 4=very important

6. Summary and conclusion

This study shows vanilla is agronomically suited to Ermera and Manufahi. This is supported by the data on climatic and edpahic requirements of vanilla. It is likewise backed by 97 per cent of the respondents who said that vanilla is growing well in their areas. However, currently, the yield levels of vanilla in Timor Leste is very low compared to the potential yield of vanilla. This shows that there is still a significant opportunity to increase productivity levels.

One of the reasons for the low yield is the low levels of input use as well as poor management practices, which stem from lack of knowledge on vanilla production. Most of the farmers do not traditionally grow vanilla so have limited experience in growing their crop. Farmers also have poor access to inputs as well as price information.

The costs and returns analysis also showed that growing vanilla is profitable even at the productivity levels and the market price at the time of the study. Further simulations also showed that vanilla can be a profitable enterprise even at the current low market price, as long as productivity levels are increased. As there is a ready market for vanilla, it seems that vanilla agribusiness in Ermera and Manufahi offers good prospects for future development. However, as the main market for vanilla is overseas, there are high risks involved as prices are volatile and dependent on world market trends. While farmers currently have a ready market in the form of the cooperative, CCT/ NCBA, most of the vanilla is exported and hence is influenced by world market demand. The fact that there is a cheaper substitute product available (synthetic vanilla), which is increasingly becoming popular in international markets, is an additional challenge. Farmers also do little or no value-adding, hence can not demand a higher price for their product. Therefore apart from raising the current productivity levels, it is important to develop and seek niche markets.

Below are some recommendations from this study.

- There is a need to improve the quality, quantity, and productivity of vanilla in the selected sites in East Timor. This can be done by providing training to farmers on farm management and providing technical advice on vanilla farming.
- Improving infrastructure particularly in irrigation or access to water availability and uncertainty are also likely to increase current productivity levels.
- There is a need to build farmers capacity in value-adding, by perhaps providing the necessary support (technical and training) on how to dry vanilla to improve the value of their product and not limit farmers to selling only wet vanilla.
- There is a need to improve access to inputs and price information. Farmers relied on family and friends for price information, which can sometimes be unreliable. Yet, price was the main factor identified by farmers that influenced their production decisions. Improving price information will help farmers make better production as well as marketing decisions.

In conclusion, there is a good potential for agribusiness development in East Timor. However there is a need to improve productivity through improved farm management and input availability. Likewise, there is a need to find a niche market such as organically certified vanilla to ensure better prices, and hence, income for farmers. Most of the vanilla in Timor Leste is grown organically. This may be used to their advantage, particularly if a market for high grade certified organic vanilla is found.

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