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Feasibility Study Report

Coconut Fibre and Coconut Peat Business Prospects in Timor-Leste

Contents

Title:
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Executive summary

Summary

Coconut is widely planted in rural areas across municipalities in Timor-Leste. Rural areas play an important role in national development, not only because most Timorese live there but because they contribute greatly to create national stability. The operation of coconut businesses will support a more balanced economic development within the territory, increasing regional income and lifting farming communities out of poverty.

The purpose of this study is to conduct a feasibility analysis for the establishment of coconut businesses in Timor-Leste, particularly those processing coconut fibre and coconut peat. The first step to increase the value added and the efficiency within the coconut sector implies, to develop centralized coconut processing units within coconut community plantations. In other words, communities should have a small scale and integrated coconut processing factory. The factory could be managed by a village-owned enterprise or cooperative. The community would collect the coconut, transport, and store them close to the de-husking station and then process the husk into coco fibre and coco peat and the coconut meat into either VCO or Crude coconut oil.

Timor-Leste needs to implement some actions to be competitive in the global market, reducing exporting costs to be able to compete with the main exporting countries. Moreover, for the sake of sustainability, Timor-Leste needs to strengthen agricultural and horticultural produce to attend the national demand for foodstuff. It is important to reduce the amount of imported food and increase the national production. [(1)]Based on data from Annual Trade Statistics of Timor Leste, in 2022 Timor Leste imported US$ 3.317.000 of vegetables and certain roots and tubers and US$ 2.690.000 of fruit and nuts, edible; peel of citrus fruit or melons. If Timor-Leste focuses on improving agroforestry capability, these imports can be reduced. Food security should be prioritized before exports. Cocopeat can be used to improve soil structure, water and nutrient retention which is low due to limited water availability in some regions and pH regulation which is inadequate due to the predominance of rocky and limestone soils. Furthermore, based on the same data in 2022 Timor-Leste imported furniture; bedding, mattresses, mattress supports, cush-ions and similar stuffed furnishings; lamps and lighting for a value equal to US$ 14.711.000. Mattress can be made using coco fibre together with latex following a very simple process and just installing some semi-modern machinery. This could be coupled with the provision of new TVET courses on training, building the technical and industrial capability and increasing the skills of the labour force.

To support the development of potential coconut businesses, a feasibility study inform various parties, such as banks, investors, local and central governments, about the investments that can be undertaken. The conclusion of the study is that coconut businesses are technically and financially feasible in Timor-Leste.

Introduction

Coco fibre

Description: Coco fibre, also known as coir, is a natural fibre extracted from the husk of coconuts. It is the fibrous material found between the hard, internal shell and the outer coat of a coconut. Coco fibber's high content of cellulose and lignin gives it strengths and durability. Coconut fibre and coconut peat are extracted using machines that mechanically separates the fibre from the hard shell and the outer skin. Another machine shifts to separate the coconut peat out of the coconut fibre.

Applications of coco fibre include:

1. Agriculture and Horticulture: Coco fibre is used to make geotextiles, mulch mats, and plant liners. It helps retain moisture in the soil and provides good aeration for plants roots.
2. Erosion Control: Coir mats and blankets are used to prevent soil erosion in landscaping and construction projects.
3. Home and garden products: It is used in the manufacture of doormats, brushes, and mattresses.
4. Automotive and upholstery: Coco fibre is used in car seat padding and other upholstery due to its durability and resilience.
5. Filtration: Coir is used in water filtration systems to remove impurities and improve water quality

The importance of coco fibre stems from:

1. Sustainability: Coco fibre is a renewable resource, making it an eco-friendly alternative to synthetic materials
2. Biodegradability: Being natural it decomposes without harming the environment.
3. Versatility: Its diverse applications across industries make it a valuable material.
4. Economic value: It provides an additional income source for coconut producing regions, contributing to rural development and employment.

Coco peat

Description: Coco peat also known as coir pith or coir dust is the spongy, peat like material that is a byproduct of processing coconut husks. It is highly absorbent and can hold water up to eight times its weight. Coco peat is processed and compressed into blocks or pellets for various uses.

Applications of coco peat include:

1. Soil amendment: Coco peat is used to improve soil structure and enhance water retention. It is often mixed with soil to improve aeration and drainage.
2. Growing medium: It is used as a substrate in hydroponics and container gardening. Its ability to retain moisture and nutrients makes it ideal for plant growth.
3. Seed starting: Coco peat provides an excellent medium for seed germination due to its fine texture and moisture retention capability.
4. Animal bedding: It is used as bedding material for pets and livestock because it is soft, absorbent, and odour neutralizing.
5. Composting: Coco peat can be used to balance compost piles, enhancing decomposition, and nutrient content.

The importance of coco peat stems from:

1. Water conservation: Its high-water holding capacity reduces the need for frequent watering, conserving water in agricultural and gardening applications.
2. Sustainability: Like coco fibre, coco peat is a byproduct of coconut processing, promoting zero waste and sustainable practices.
3. Soil health: It improves soil health by enhancing its physical properties, promoting root growth, and increasing microbial activity.
4. Environmental impact: Using coco peat reduces the reliance on peat moss, the extraction of which can damage peat bog ecosystems.
5. Economic benefit: It adds value to the coconut industry, providing additional revenue streams for farmers and producers.

▶ Location

To determine if Timor-Leste is a suitable location for coco fibre and coco peat businesses, we need to consider several factors including the availability of raw materials, land /terrain, market demand, infrastructure, labour availability, and government support. Here is a detailed analysis:

1. Availability of raw materials

Coconut farmers prefer to harvest young coconuts because it yields better prices than ripe/old coconut. In Timor-Leste the only option to sell ripe coconuts is as copra which is exported to Surabaya, Indonesia. Prices for copra vary widely, often influenced by region, local market conditions and quality but typically remain within a similar range. [(2)]Nevertheless, copra has the lowest tier price among coconut meat byproducts. Therefore, the farmers will only harvest ripe coconuts when the price of copra is good. As a result, many ripe coconuts are abandoned in trees, fall off or remain neglected on the ground without any further processing.

Few farmers utilize the meat of ripe coconuts to make VCO (Virgin Coconut Oil) because it requires energy (fire to cook) and processing knowledge which few of them possess. The output of the traditional VCO household production often has low quality and poor packaging, reducing their marketability and making difficult for households to obtain a fair return. [(3)] Strict regulations on food and cosmetic materials by the government in export destination country also often discourage farmers from developing their VCO productions.

The development of an integrated industry that process the coconut meat creating more value will increase farmer's income and provide alternative business opportunities, more attractive than just selling low-value copra to Surabaya or other industrial cities. This in turn will encourage farmers to harvest more coconuts, both young and ripe to meet the demand from an incipient local industry or even to create their own final goods within the household and sell directly to customers. Abundant and consistent supply of raw materials is a positive starting point for a highly sustainable industry.

2. Land/terrain and water supply

Almost half of Timor-Leste's 15,000 sq/km land area has a slope of 40 degrees or more making it scenically beautiful but extremely difficult for road construction and cultivation. Steep terrain combined with inconsistent rainfall and stony, limestone soils are challenging for the farmers[4]. This kind of terrain needs a specific requirement for most cultivations.
Most of Timor-Leste's large, braided rivers completely disappear in the dry season. Nevertheless, during the rainy season rivers can turn into raging torrents, and sometimes into flash flooding (4).

3. Market demand

- Local demand: There is a potential market from agricultural and horticultural farmers as the soil in many areas of Timor-Leste are not fertile enough. Coco peat is an excellent component to make organic fertilizer, combined with peat and other organic components. With improved packaging, coco peat and coco fibre can also be sold directly to consumers in the home gardening market segment, through local marketplaces, online and offline, using for example Halo Dili.
- Export potential: There is potential for exporting coco fibre and coco peat to neighbouring countries and international markets. The global demand for sustainable and eco-friendly products is increasing, which could create opportunities for export.

At this time, Timor-Leste is not ready for exporting coco fibre and coco peat. Ocean freight and other local costs in Timor-Leste are quite high compared to competing producing countries.

Export markets also require certifications, such as Phytosanitary, Fumigation, ISPM which are not easily accessible to companies in Timor-Leste. Such certifications have to be obtained from Australia or Indonesia because Timor-Leste does not have national laboratories capable of issuing those necessary certificates. Obtaining these certificates from neighbouring countries will increase export costs.

Below is table 1 as an example of a quote received from freight forwarding companies to illustrate the staggering difference in costs in shipping a container from Dili, Timor-Leste compared to Surabaya, Indonesia to two of the most common coconut export destinations in China and South Korea.

Export cost	Indonesia/Surabaya [5]	Timor Leste/Dili [6]
Ocean Freight to Busan 40' HC	US$ 277	US$ 2400
Ocean Freight to Qingdao 40' HC	US$ 299	US$ 1800
Local cost		
Doc fee	IDR 7,350,000 /US$ 459.38 all services are included	US$ 40
Lift on MTY pick up container Depot		US$ 20
Trucking 2 ways		US$ 500
Custom clearance		US$ 250
Handling		US$ 100
LOLO		US$ 20
CSS storage(*optional*)		US$ 20/day
Fumigation		not available
Phytosanitary		not available
ISPM	IDR 1,850,000/US$ 115.6	not available
Seal fee		US$ 5
GST		OFR x 2.64%
ISPS		US$ 11
THC		US$ 401
Telex fee		US$ 50

Table 1. The comparison between export cost from Surabaya, Indonesia and Dili, Timor Leste
Source: Inquiry to both freight forwarders

Examples of calculation for coco peat, using the export market price:

Export price (FOB) (based on ICC, July 2024)	US$	680	for	1,000	KG
Export Price /KG (FOB)	US$	0.68			

40 HC container fits 20 pallet of 1000 KG cocopeat

			Cost		
Total weight/ 40 HC				20,000	KG
Export Price/ 40 HC				13,600	US$
Various fees and trucking (40 HC)		US$	1,417		
Lab fee, fumigation, ISPM		US$	1,000		
		Subtotal	US$	11,183	
Profit	10%	US$	1,118		
Production cost (assumptions)		US$	1,000		
		Subtotal	US$	9,065	
Farmgate price per KG		US$		0.45	per KG

Note: Calculation by Tendy Gunawan, Agrofoestry Skills Project

5. Labor availability

- **Skilled and unskilled labor:** Availability of both skilled and unskilled labor is important. Training programs may be necessary to develop specific skills required for the processing and manufacturing of coconut-based goods.
- **Labor costs:** Lower labor costs can be a competitive advantage. The unskilled labor wage in Los Palos municipality is around US$ 120/month, but minimum wage in Timor-Leste is set at US$135/month.

6. Government support and incentives

- **Policies and regulations:** The government needs to make policies to support agricultural and industrial development that encourage farmers to increase their demand for coco peat and organic fertilizer. Favourable policies and incentives can significantly benefit the development of the coco fibre & coco peat industry.
  The government could invest in the improvement of the irrigation systems, subsidize the production of organic fertilizers and hire extension agricultural workers to visit farmers communities and encourage them to use organic fertilizers, monitoring the results after a certain period of time.
- **Support programs:** Government or international development cooperation programs can support the growth of small and medium enterprises (SMEs) in the agricultural sector, benefitting the coco fibre and coco peat business too.

Conclusion

Coco fibre and coco peat are valuable by-products of the coconut industry with diverse applications in agriculture, horticulture, manufacturing, and environmental management. Their sustainable nature, combined with their functional benefits, makes them important materials in promoting eco-friendly practices and supporting the economies of coconut-producing regions. By leveraging these natural resources, we can contribute to a more sustainable and resilient agricultural and industrial ecosystem.

Limitation: This study focuses on the direct costs and revenue that can be generated by private businesses. Additional research on the social and intangible benefits that the development of the coco fibre and peat industry could have for rural communities should be undertaken too.

Recommendations

1. While waiting for the export-ready ecosystem of Timor-Leste and investor's interest to make a bigger investment, for now we can utilize the whole coconut process business by encouraging development at the village level. The national government can empower local governments to manage their assets independently, through Village-Owned Enterprises (VOE) for example. The management of Village-Owned Enterprises (VOE) is carried out by the local government together with the community. Management that directly involves the villagers is expected to boost the economy by empowering the community. The VOE can be established in the central area of coconut's plantation, procuring coconuts from nearby villages. The meat of coconuts can be processed into coconut oil both crude and VCO, while the husk process into coco peat and coco fibre or coco chips. Both processes could be in one place, so it saves some transport cost.

2. The government should support local coconut oil producers so they can compete in price with imported palm oil. Imports of edible oil in Timor-Leste are worth about US$ 2 million a year. If coconut oil is massively produced in a more efficient way, the import of edible oil could decrease. At the same time, this would result in more supply of husk as a byproduct from coconut oil production and promote the increase in the processing of coco fibre and peat.

3. Due to stony, limestone of the terrain/land and limited water supply, some areas where normal cultivation techniques cannot be applied, planting in bags could be an alternative. In these cases, cultivation in green-house or shelters is common and coco peat is a very good planting medium for these environments. [7] The example of how it started to build from preparing the ground, started seedling, nurturing plants until harvesting was take time 6 months. The writer made an illustration as follow:

Figure 1. Cocopeat uses in bags in shelter of less fertile land at Ivory Coast, West Africa

4. The writer expect government are able to provide subsides fertilizer such as NPK 15-15-15 Nitrogen(N), phosphorus (K) and Potassium(K), so the plant will be more productive and increase crops yield. Furthermore, government can also provide a good quality of coconut seed. Abundant and consistent supply of raw materials is a positive indicator for a highly sustainable industry.

5. Encourage and support micro and small-sized enterprises with a particular focus on the development of rural areas through training and capacity-building programmes such as producing organic fertilizer using cocopeat mixture with cattle manure, rice husk, and then fermented with bio-catalyst, etc. [8] Producing organic fertilizer need a simple knowledge, affordable tools and easy process, as shown on figure 2.
   Moreover, the national government can also give incentives and subsidized prices to encourage other local farmers to purchase the organic fertilizer produced by communities. Building a mentality of "Local support Local", meaning local business support other local business will have a positive multiplier effect for the development of rural economies.

6. The other simple application using coco fibre is make a pole for planting vanilla, pepper, etc. Woman and elderly people are able to make pole and started to plant a high value crop at the back of their house(9). A simple pole making are shown on figure 3.

7. Cooperate with the Chamber of Commerce and Industry, especially with the members who had experienced study abroad, who are able to learn and teach young people how to create markets through digital marketing and make a good connection into international markets. Furthermore, there are some platforms for selling handmade craft such as Etsy and social site where we can collect and share images of anything we find interesting such as Pinterest. Young people of Timor-Leste could learn searching for an inspiration, doing some experiments to make a simple handicraft with simple tool, adapt, modify, then try to sell it abroad. The writer captures some pictures from Etsy about a pole made by coconut fibre and its modification to make it more interesting, shown in figure 4.

Figure 2. Processing cocopeat into organic fertilizer at Bali, Indonesia

Figure 3. Making pole using coco fibre by elderly people at Bali, Indonesia

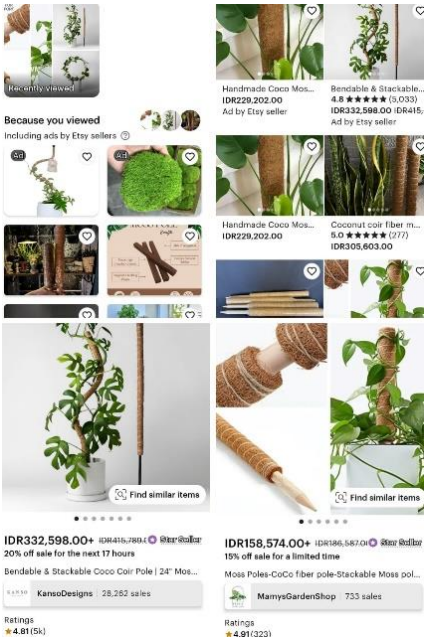

Figure 4. Selling pole made by coco fibre in Etsy platform.

8. Investment opportunities may come up when the coconut industry has reached the stage where it looks appetizing for investors. At this stage, infrastructure and government support should already be strong. Business owners and stakeholders are well educated and experienced in their industry, and production output has increased and is consistent. Coconut products and its byproducts are always in demand, and traders are always looking for new, reliable sources. [10]The following figures are example of a company who has a business model by manage third-party investments to develop the agro-export business in Peru, to cultivating various plant such as blue berry, in some growing bags filled with coconut peat and coconut chip on the sandy loam land plot, shown in figure 5&6

9. The combination of underdeveloped infrastructure, limited port facilities, and less competitive economic policies contributes to the higher transport costs in Timor-Leste compared other countries. [11]Furthermore, high import dependency, lack of economies of scale, limited market competition, and currency factors, all contribute to the relatively higher prices in Timor-Leste as well. These factors create an environment where the cost of goods and services is elevated, impacting the overall cost of living.
   To bridging the cost gap and reducing the cost gap between Timor-Leste and other Asean countries, it is requiring a comprehensive approach that includes infrastructure investment, local production support, policy reforms, market competition enhancement, supply chain improvements, financial incentives, capacity building, technology adoption, and international collaboration. By addressing these areas, Timor-Leste can create a more competitive market environment, reduce costs, and improve the standard of living for its citizens.

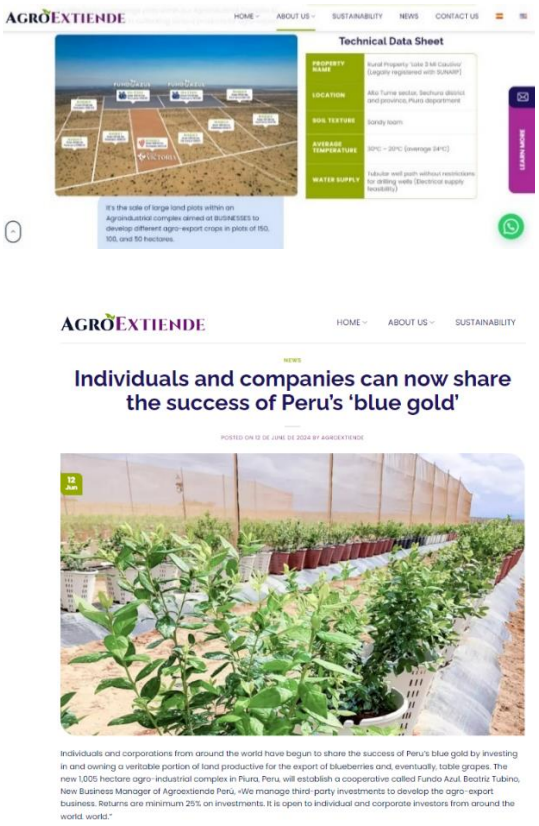

Figure 5 & 6. Website captures of Agroextiende Peru

APPENDICES

1. Publication-External-Trade-Balance-2022
2. See https://coconutcommunity.org/public/index.php/page-statistics/weekly-price-update
3. See https://www.foodstandards.gov.au/consumer/imported-foods
4. See https://www.timorleste.tl/east-timor/about/geography-climate/
5. See https://salinalintas.com/?page_id=43&lang=en
6. See https://www.mellship.com/Agency/TL
7. See https://www.agrifer.nl/hortivoire/
8. See https://www.facebook.com/BaliCocoFibreAndCocoPeat/photos_by
9. See https://www.facebook.com/BaliCocoFibreAndCocoPeat/photos_by
10. See https://agroextiende.com.pe/en/home/

The International Labour Organization

The International Labour Organization (ILO) is the UN agency for the world of work. It was founded in 1919 as part of the Treaty of Versailles that ended World War I, to reflect the principle that universal and lasting peace can only be achieved if it is built on social justice. The ILO is the only 'tripartite' United Nations agency that brings together representatives of governments, employers and workers to shape policies and programmes for social justice and decent working and living conditions for all women and men. For this it was awarded the Nobel Peace Prize in 1969. The ILO is also responsible for drawing up and overseeing international labour standards (Conventions and Recommendations). This unique arrangement gives the organization an edge in incorporating 'real world' knowledge about employment and work into its activities.

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