

Coconut Sugar Production in Polomolok, South Cotabato, Philippines

Presented by
Southeast and East
Asia Group (8)

Date :
14 December 2022



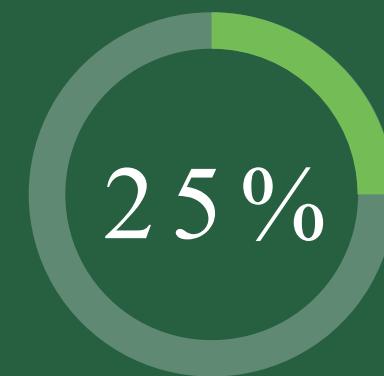
Contents

01	02	03	04	05
Introduction	Farm Description	Cost-Benefit Analysis	SWOT -TOWS Analysis	Investment Suggestion
<ul style="list-style-type: none">• Regional Profile• Significance of Agriculture• Significance of Coconut Sugar• Coconut Sugar Production in the Philippines	<ul style="list-style-type: none">• Location• Farm Map	<ul style="list-style-type: none">• Annual Production Costs• Annual Benefits• Profitability Analysis	<ul style="list-style-type: none">• Strengths• Weaknesses• Opportunities• Threats• SWOT -TOWS Matrix	<ul style="list-style-type: none">• Assumptions• Depreciation• Costs -Benefits Computation• Net Present Value• Internal Rate of Return

Introduction



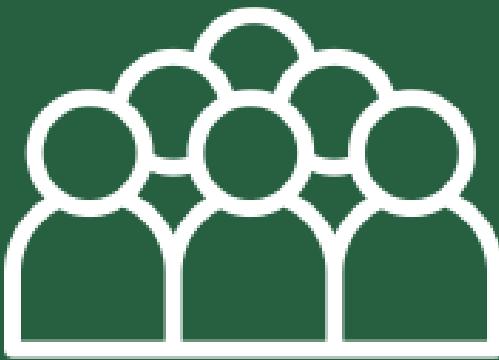
East Asia and the Pacific in Numbers



Directly employed in agricultural activities



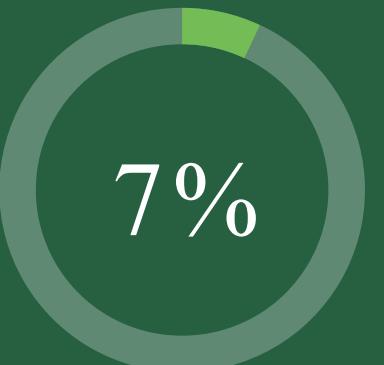
Live in Rural Areas



2.37 Billion (2021)



230 million live below the poverty line



Agricultural Land Area



Forested Land



Arable Land

Significance of Agriculture in the Philippines



Agricultural Land

- Crops, trees, and seeds cultivation
- Fisheries
- Livestock raising
- Harvesting and processing farm products



Gross Domestic Product from Agriculture, Forestry, and Fishing sector

- Rice
- Corn
- Coconut



Labour Force in Agriculture and Agriculture -related fields

Other Farming Systems in the Philippines

- *Rice and corn farming*
 - Utilizes 56% of the total agricultural land area
- *Complex upland food -production systems of indigenous peoples' communities*
 - 18% of the 55% upland areas
- *Organic farming practised by small -scale farmers*
 - 4% of the total agricultural land area
- *Bio -intensive gardening*
 - Uses small land area (18 to 45 sqm)

Significance of Coconut Sugar

- Sweetener traditionally used in tropical Asian cuisines
- Produced by collecting the sap from the coconut palm tree blossoms
- Sap > heated constantly > moisture evaporates > crystalline, coarse to fine powder in varying brown hues
- Considered a healthier alternative sweetener due to its low Glycemic Index value of 35
- Huge international market potential
- Has contributed to poverty alleviation – provided innovative product that is easy to store and has a great taste



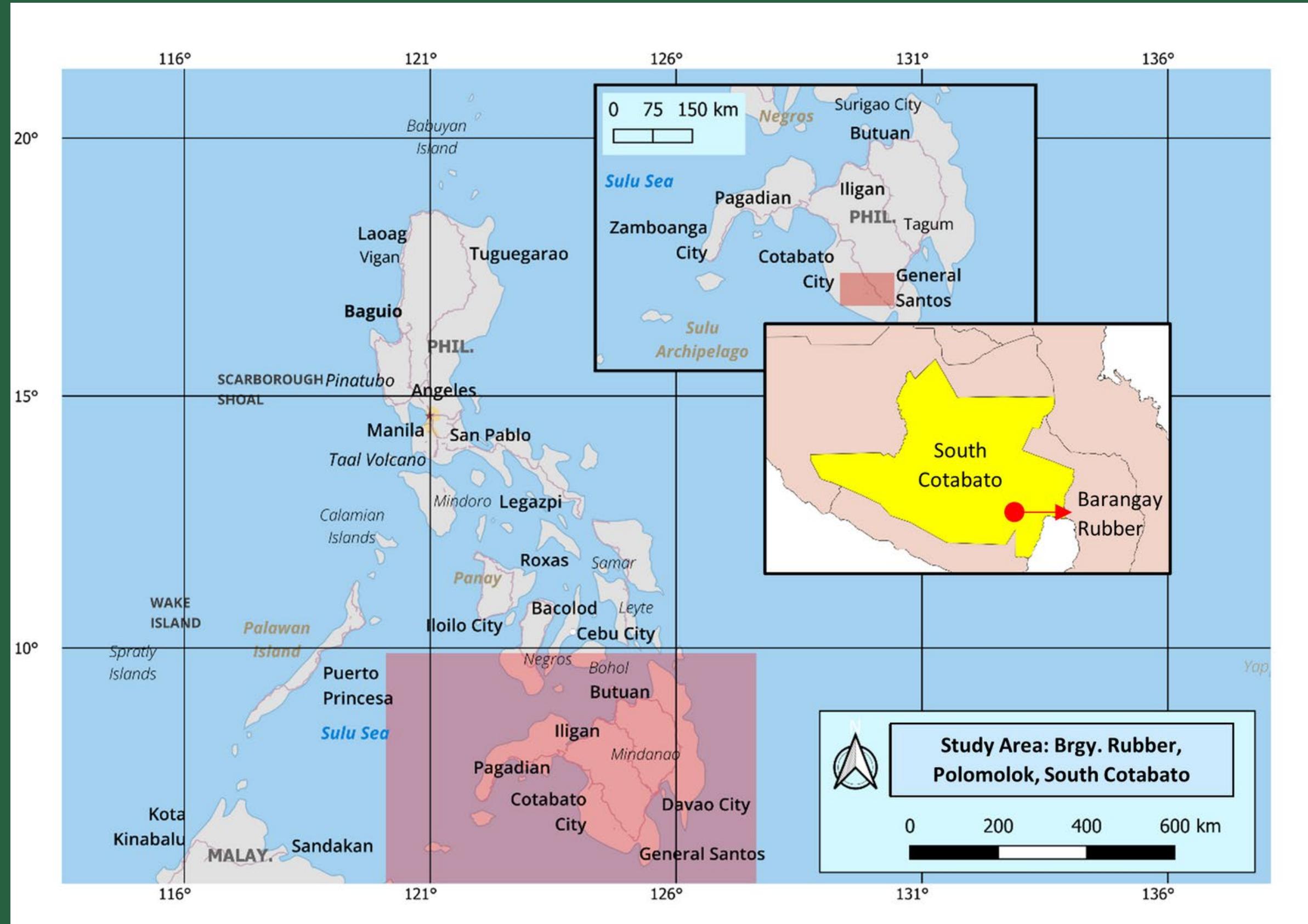
Coconut Sugar Production in the Philippines

- The Philippines is one of the leading coconut producers in the world - 45% coconut production
- The majority of coconuts and their associated products are produced for exportation, which contributed 58.7% of the total exports.
- Since 2019, exported to countries like Australia, Canada, the EU, the Middle East, and South Korea
- The exports grew exponentially from 11,200 kilograms in 2009 to 4,000 metric tons in 2018

Farm Description



Location



- The study site is situated at one of the barangays (a neighbourhood) in the Municipality of Polomolok in South Cotabato, Philippines.

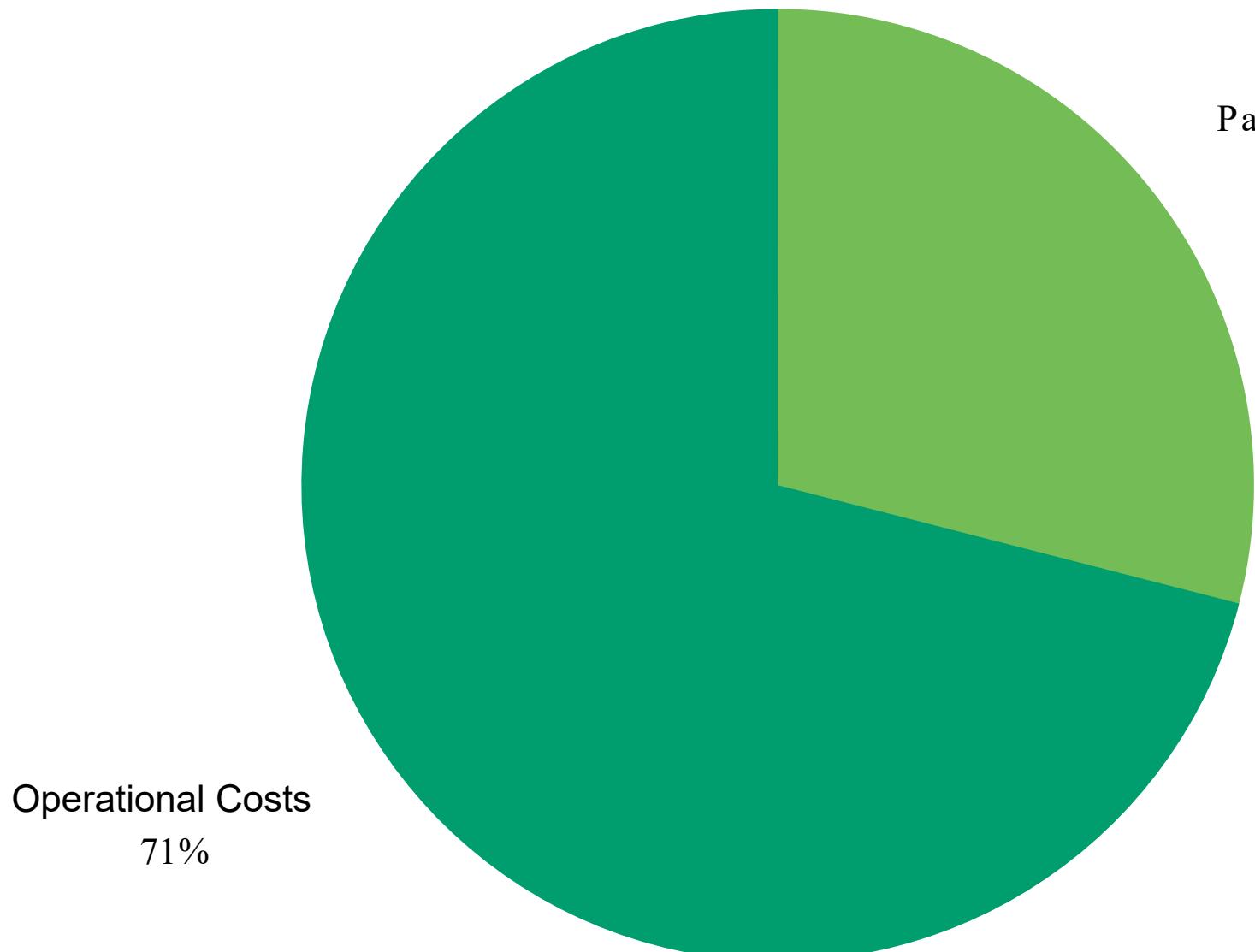
The Farm

- The farm in focus is an Integrated Farm managed by the Pangkabuhayang Agrikultura Multi -Purpose Cooperative.
- 1.2 ha of total land area
 - 0.52 ha is dedicated to coconut sugar production
 - 0.05 ha for the coconut sugar processing facility
 - 0.63 ha for other crops - cacao, copra, and other fruit bearing trees
- Produces 1.5 to 2 MT of coconut sugar per month

Cost Benefit Analysis



Annual Production Costs

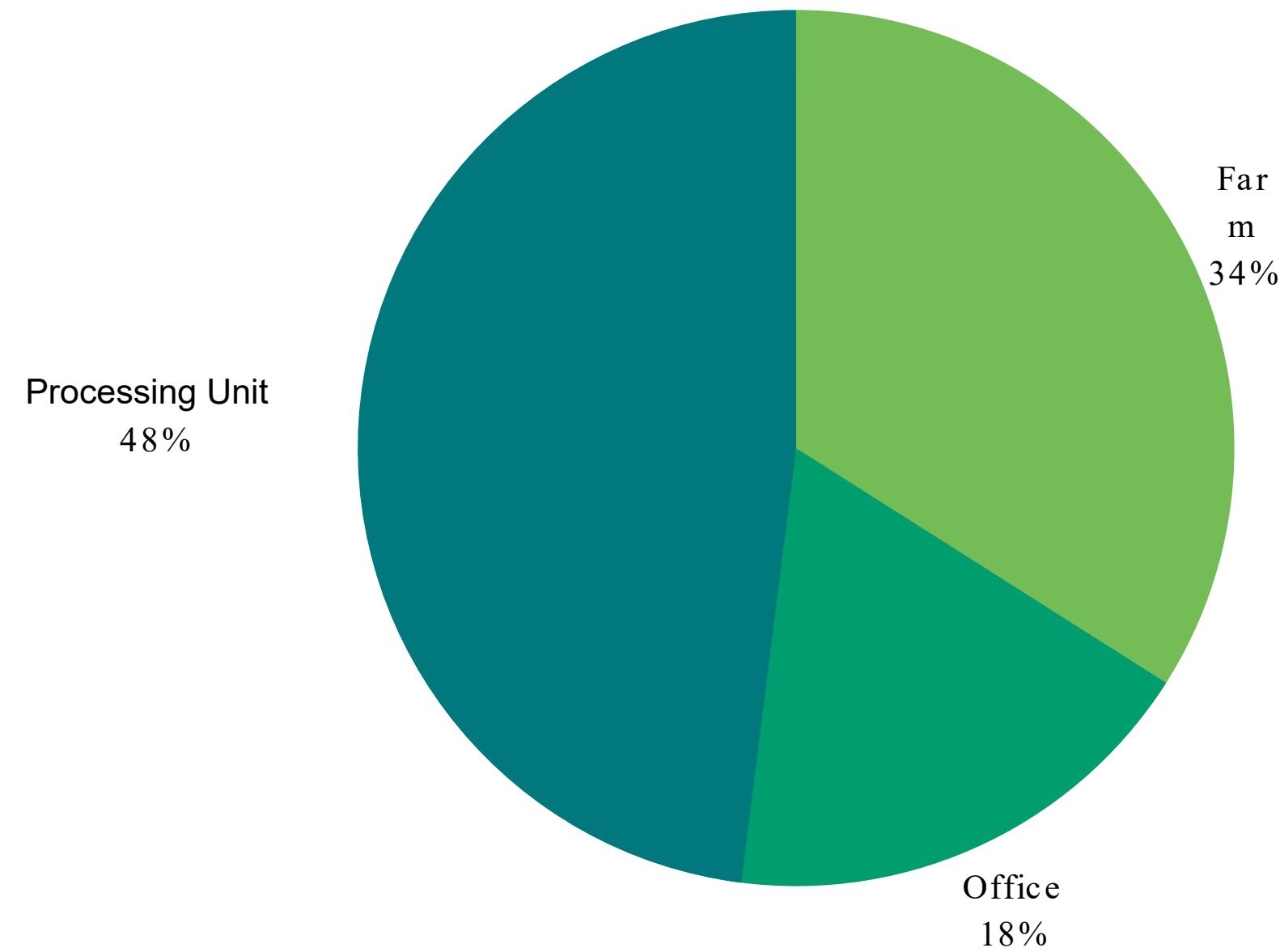


Paid Labor Costs
29%

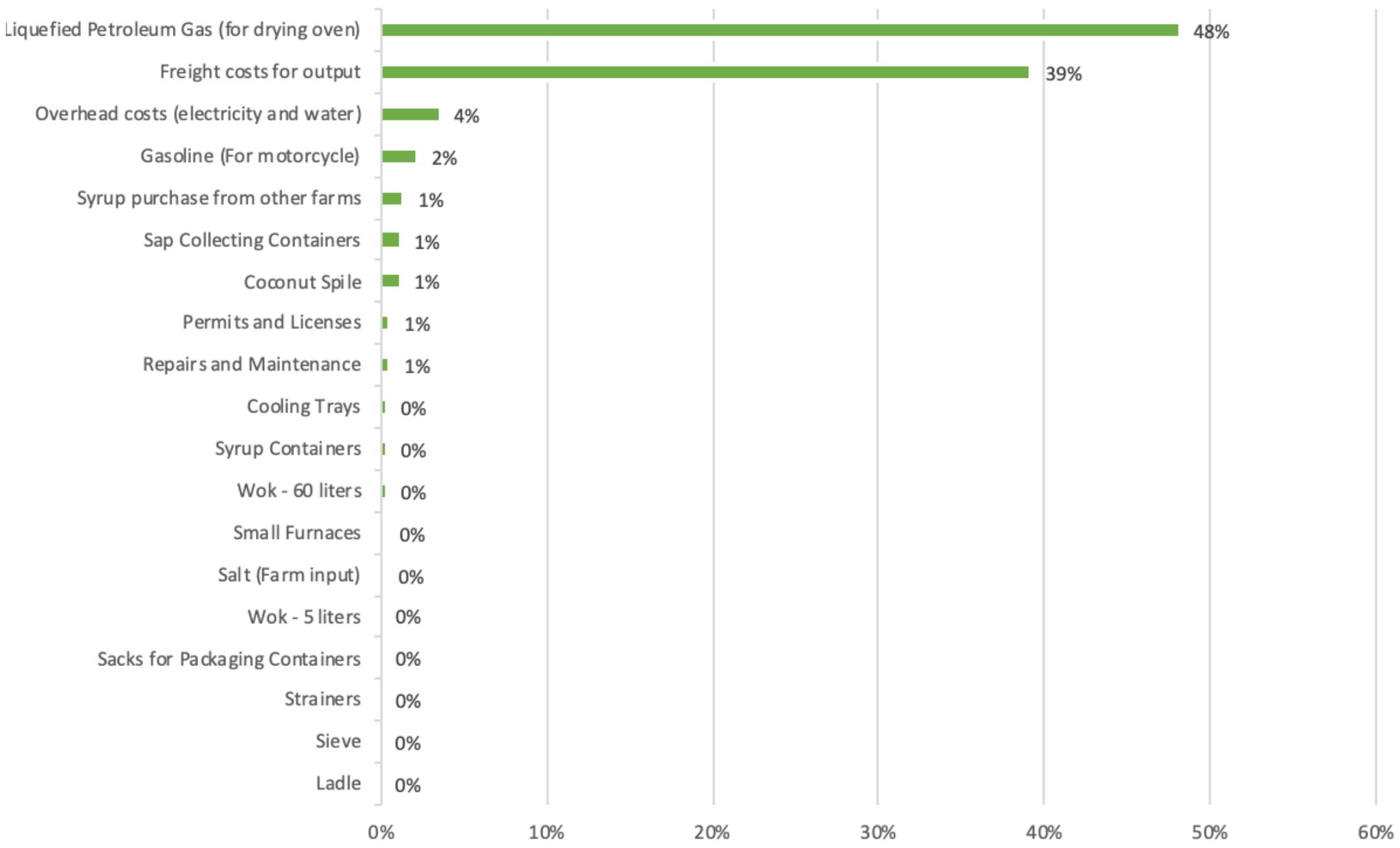
Operational Costs
71%

Cost category	PHP
Operational costs	1,681,960
<i>Syrup purchase from other farms</i>	24,000
<i>Salt (Farm input)</i>	3600
<i>Gasoline (For motorcycle)</i>	37,800
<i>Freight costs for output</i>	660,000
<i>Overhead costs (electricity and water)</i>	60,000
<i>Liquefied Petroleum Gas (for drying oven)</i>	810,000
<i>Wok - 60 liters</i>	6,000
<i>Wok - 5 liters</i>	1,000
<i>Coconut Spile</i>	20,000
<i>Sap Collecting Containers</i>	20,000
<i>Syrup Containers</i>	6,000
<i>Ladle</i>	500
<i>Sacks for Packaging Containers</i>	960
<i>Strainers</i>	600
<i>Cooling Trays</i>	6,000
<i>Sieve</i>	500
<i>Small Furnaces</i>	5,000
<i>Repairs and Maintenance</i>	10,000
<i>Permits and Licenses</i>	10,000
<i>Depreciation</i>	0
<i>Land tax</i>	0
<i>Subsidies</i>	0
<i>Labor Cost (Wages hired)</i>	684,000
<i>Labor - Farm</i>	234,000
<i>Labor - Office</i>	120,000
<i>Labor - Processing Area</i>	330,000
<i>Paid land lease</i>	0
<i>Paid interest</i>	0
<i>Calculated land lease</i>	0
<i>Calculated interest on capital</i>	0
<i>Calculated wages</i>	0
Total production cost	2,365,960

Annual Production Costs - Labour



Annual Production Costs - Operation



	Production (in kilograms)	Price per kilogram (PHP)	Total revenue (PHP)
Coconut sugar	24,000	150	3,600,000

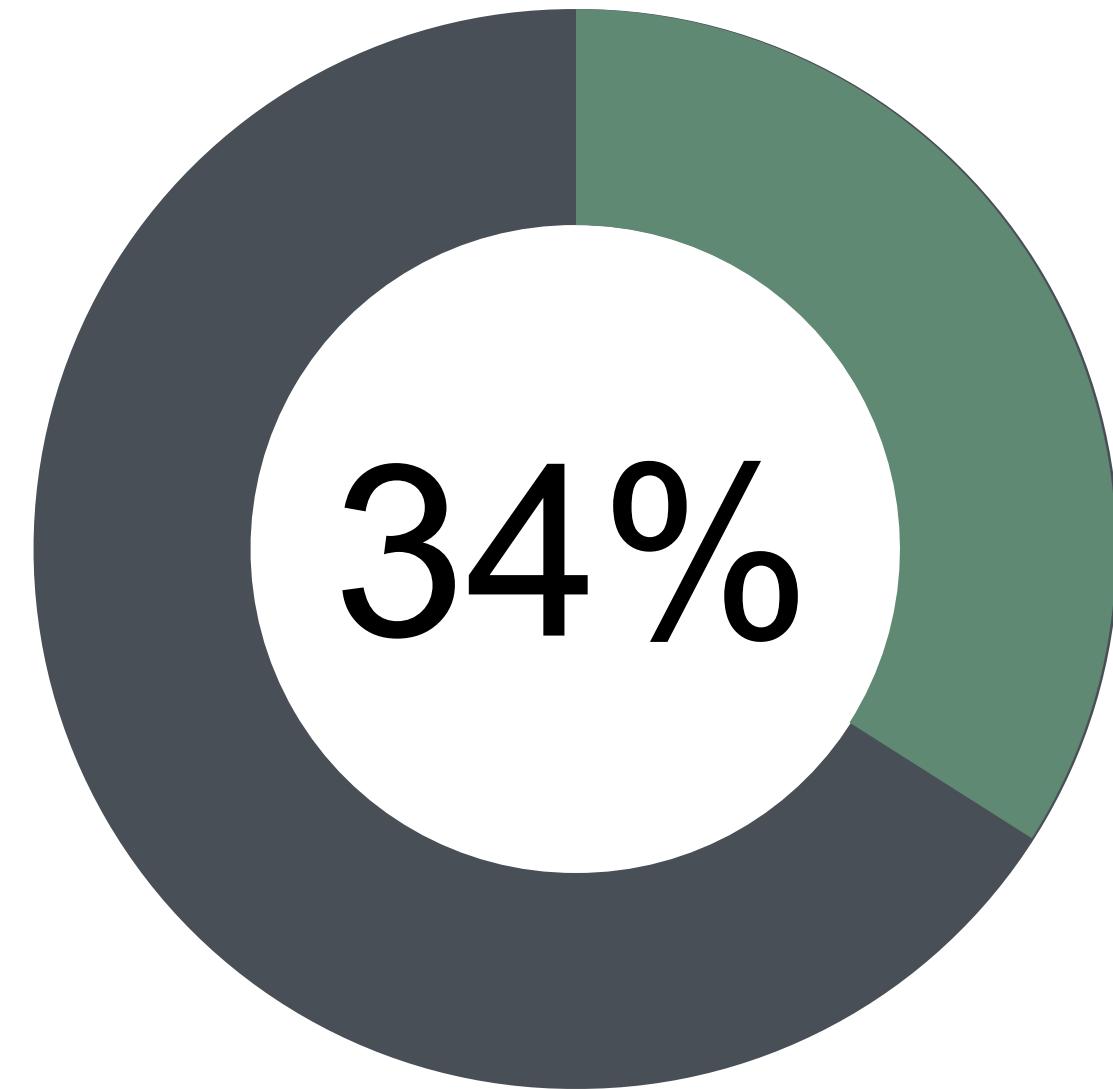
1 Philippine peso (PHP)= 0.017 Euro

Annual Benefits of the Farm

Profitability Analysis

Indicators	Explanation	PHP
Gross Output	Yield * Price	3,600,000
Gross Margin	Gross Output - Operational Costs	1,918,040
Net Margin	Gross Margin - Depreciation	1,918,040
Factor Income	Net Margin - Land Tax + Subsidies	1,918,040
Farm Income	Factor income - Waged Hired Labor	1,234,040
Farmers Income	Farm income - Paid Land Lease - Paid Interest	1,234,040
Labor Income of the Family	Farmers income - Calculated Land Lease – Calculated Interest on Capital	1,234,040
Net Farm Results	Labor Income of the Family – Calculated Wages	1,234,040

Profitability Analysis



Profit of the firm

SWOT-TOWS ANALYSIS



Strengths

Coconut sugar is a
healthier alternative
sweetener

Fast inventory
turnover

Relatively easy
production process

Weaknesses

Labor intensive process

Producers have limited local promotion and marketing initiatives

Small network of skilled sap collectors

Price of coconut sugar is higher than conventional refined sugar

Tall coconut variety makes harvesting more challenging

Coconut sap ferments quickly

Opportunities

Contracting and acquiring third-party certification for organic, food safety standards

The increasing number of health-conscious consumers and diabetic individuals

Large export market in Europe for coconut sugar

The availability of online platforms for marketing

Research and development efforts, and the mechanization of the coconut sugar production technology

Coconut levy fund reinstated by the government through Executive Order 172

Threats

Presence of major competitors with mechanization advancements capable of meeting international market demands

Unavailability of raw materials for processing especially during dry season

Coconut sugar is not exempted from value added tax (VAT)

COVID-19 economic restrictions

SWOT-TOWS Matrix

S-O Strategies	W-O Strategies
<ul style="list-style-type: none">• Invest in export marketing efforts to reach as much target international consumers as possible, highlighting the health benefits of coco sugar.• Utilize online platforms for global reach.• Innovate for better yielding varieties and improve mechanization of processes• Utilize third party certifications to set higher production value and strengthen overseas markets• Structure and coordinate discussions with the government and key experts on formulating the Coconut Farmers and Industry Development Plan as per Executive Order 172 (2022)	<ul style="list-style-type: none">• Intensify research and development efforts to create varieties that favor efficient harvesting and processing of raw materials• Utilize available marketing platforms; highlight health benefits; partner with producers in other countries to strengthen marketing efforts• Acquire third party certifications to standardize businesses strategies and create a wider network of buyers and producers• Collaborate with government, NGOs, or the private sector to conduct trainings and expand technical support to sap collectors and innovate for mechanization

S-T Strategies	W-T Strategies
<ul style="list-style-type: none"> • Closely collaborate with PCA and reach out to potential investors highlighting the health benefits of coconut sugar, social value of farmers' cooperative-managed farms, and the need to develop production systems to keep up with competitors • Structure and coordinate discussions with the academe, public sector, private sector, development partners, and NGOs on ensuring support in setting up and adopting up-to-date and cost-efficient production technologies • Sustain active efforts on recommending policies to the government on tax exemption for coconut sugar through cost-benefit analysis for the industry • Develop viable business plans including contingency plans to foresee and respond to risks and hazards 	<ul style="list-style-type: none"> • Invest in medium to long-term capacity building activities which are easily accessible to farmers • Support research and innovation efforts to discover more ways of producing coconut sap effectively • Pitch the economic viability of shifting to mechanization of coconut sugar production to the government, NGOs, and business sector to meet international market demands • Acquisition of organic certification from an official third-party certifying body ensuring the price competitiveness of the product • Updating of the coconut sugar industry roadmap by the PCA in close partnership with key stakeholders • Invest in up-to-date production tools and equipment to aid in production process

Investment Suggestion





Industrial Electric Powered
Drying Oven

Assumptions

- The cost of the electricity -operated drying oven is 3,800 US dollars, which is equivalent to PHP 271,733 .80 .
- The assumed operational life span of the new drying oven is 10 years .
- All the operational costs, except labor for the office, and electricity costs*, will proportionately increase with the increase in production .
- The interest rate used is 5% in accordance with the rates published by the Central Bank of the Philippines .

Depreciation

Year	Depreciation	Interest cost	Book value (begin)	Book value (end)	Yearly cost
1	21,738.7	10,325.88	217,387.0	195,648.3	32,064.6
2	21,738.7	9,238.95	195,648.3	173,909.6	30,977.7
3	21,738.7	8,152.01	173,909.6	152,170.9	29,890.7
4	21,738.7	7,065.08	152,170.9	130,432.2	28,803.8
5	21,738.7	5,978.14	130,432.2	108,693.5	27,716.8
6	21,738.7	4,891.21	108,693.5	86,954.8	26,629.9
7	21,738.7	3,804.27	86,954.8	65,216.1	25,543.0
8	21,738.7	2,717.34	65,216.1	43,477.4	24,456.0
9	21,738.7	1,630.40	43,477.4	21,738.7	23,369.1
10	21,738.7	543.47	21,738.7	0.0	22,282.2
Total					271,733.8

Cost-Benefit Analysis

Particulars	Before Investment	After Investment	Remarks	Change between After and Before Investment
Production Benefit	3,600,000	5,193,000	At the before investment scenario, there are 52 coconut trees that can produce 2000 kg of coconut sugar (equivalent to 38.4615 kg per tree sold at PHP 150 per kg). In the after-investment scenario, 23 trees that were previously harvested for its copra will now be harvested for coconut sugar, which will result to the indicated amount, 44% higher than the before investment benefit.	1,593,000

Cost-Benefit Analysis

Costs	Before Investment	After Investment	Remarks	Change
Overhead costs (electricity and water)	60,000	86,538	Increase proportionate to increase in production	26,538
Additional electricity costs*	-	111,345	Additional electricity costs due to electric-powered drying oven	111,345
Liquefied Petroleum Gas (for drying oven)	810,000	-	- No costs anymore, since it has been replaced by an electric-powered drying oven	(810,000)
Repairs and Maintenance	10,000	14,423	Remain the same, since this cost refer to the building repairs and maintenance and is not directly related to production	4,423

Cost-Benefit Analysis

Costs	Before Investment	After Investment	Remarks	Change
Permits and Licenses	10,000	14,423	Remain the same, since this cost is not directly related to production	4,423
Labor - Office	120,000	120,000	Remain the same, since it is assumed that administrative tasks remain constant despite increase in production	-
Total Costs	2,365,960	2,302,441	There is a negative value, which indicates that the total operational costs after the investment is lower than before the investment. This translates to added benefits in terms of operational costs savings.	(63,519)

$$NPV =$$

Net Present Value

$$\left(PV \text{ of benefits} = \sum_{i=1}^n \frac{X}{(1+r)^n} \right) - \left(PV \text{ of costs} = \sum_{i=1}^n \frac{Y}{(1+r)^n} \right)$$

Net Present Value

Period	Benefits		Costs
	Discounted Change in Benefits	Discounted Change in Operational Costs (Costs Savings)	Discounted Costs of the Investment
Initial Amount	1,593,000.00	63,519.00	218,313.80
Year 1	1,517,142.86	60,494.16	32,064.60
Year 2	1,444,897.96	57,613.49	30,977.70
Year 3	1,376,093.29	54,869.99	29,890.70
Year 4	1,310,565.04	52,257.13	28,803.80
Year 5	1,248,157.18	49,768.70	27,716.80
Year 6	1,188,721.13	47,398.76	26,629.90
Year 7	1,132,115.36	45,141.67	25,543.00
Year 8	1,078,205.10	42,992.07	24,456.00
Year 9	1,026,862.00	40,944.83	23,369.10
Year 10	977,963.81	38,995.08	22,282.20
Total (Year 1-10)	12,300,723.74	490,475.86	271,733.80
Total Benefits		12,791,199.61	
Total Costs			271,733.80
NPV			12,519,465.81

Internal Rate of Return

$$IRR = r_1 + (r_2 - r_1) \frac{NPV_1}{NPV_1 - NPV_2}$$

- The IRR computed is equal to 609.6%. It is a significantly high IRR; therefore it is a worthwhile investment.
- This may be explained by the fact that even though the processing capacity increased, the corresponding costs for such were not able to increase the costs as much as the increase in benefits, as most costs incurred before were coming from the use of LPG.
- Even the initial investment is not that large relative to the would-be incurred benefits. As such, there is strong evidence, backed up by both NPV and IRR, to proceed with this investment.

Thank you!

- Mitchiko Paulette Aljas
- Khin Zin Win
- Youmin Li
- Maria Kiesha Yvet Mercado
- Ma. Alexandra Milan
- Jerome Carl Petamal