

# EVALUATING THE FEASIBILITY OF CAVENDISH BANANA AS A LEADING COMMODITY FOR SUSTAINABLE DEVELOPMENT IN SOUTH SULAWESI

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## Abstract

South Sulawesi Province has great potential in developing superior horticultural commodities, especially the Cavendish banana (*Musa acuminata*). This study aims to analyze the potential and opportunities for the development of Cavendish banana farming as a new superior commodity in South Sulawesi and assess its economic feasibility. With the large amount of fertile land that has not been optimized, the Cavendish banana can be a significant source of income for local communities while supporting the improvement of regional competitiveness. The analysis results show that Cavendish banana farming provides promising financial returns with productivity reaching 80,000 kg per hectare per year and an average selling price of IDR 4,500 per kilogram. Based on the financial feasibility analysis, the NPV value of IDR 499.48 million, IRR of 211.82%, and payback period of 0.5 years were obtained. In addition, the Cavendish banana also has the potential for product diversification and environmental benefits that support sustainability. This study recommends optimal resource management and collaboration between the government, private sector, and farmers to maximize the potential of this commodity as a regional economic driver.

**Keywords:** Cavendish Banana, Horticulture, Agriculture, Leading Commodity

## I. INTRODUCTION

South Sulawesi Province has a strategic position in the middle of the Indonesian archipelago. With an area of approximately 46,083.94 km<sup>2</sup>, South Sulawesi consists of 21 regencies, three cities, 306 sub-districts, and 3,045 villages/sub-districts. It plays a role as the epicenter of the national economy and the center of production and distribution of goods and services to other parts of Eastern Indonesia (1). South Sulawesi is also known as the largest producer of agricultural products in Eastern Indonesia. Its strategic location and sufficient rainfall make it one of the largest agricultural provinces in the archipelago. South Sulawesi provides 25-30 percent of Bulog's national rice needs, ranking it first nationally (2).

Agriculture plays a key role in the region's economic development by supplying food to meet local and regional needs and contributing to industrial development, Gross Regional Domestic Product (GRDP) growth, and

employment. Therefore, agricultural development must start by identifying the region's potential so that development policies can be formulated both sectorally and multi-sectorally.

The agricultural sector has long been a pillar of life for the majority of the population in South Sulawesi, contributing more than 20 percent of the total value added generated (3). The sector comprises five main sub-sectors: food crops, horticulture, livestock, plantations, and agricultural and hunting services. The South Sulawesi government is now promoting the planting of horticultural commodities on non-irrigated technical farmland and unproductive fallow land. Less than 30 percent of the land area has been utilized, with more than three million hectares of land yet to be optimized (4).

Significant economic potential can be realized if the agricultural sector uses the land productively. Developing horticultural commodities such as fruits is a hallmark of South Sulawesi, which has high economic value and potential as a source of income for the community. The existing agro-climatic diversity supports fruit development.

The agricultural sector development approach is necessary due to the unique characteristics of agricultural products, which, unlike industrial products, can be produced throughout the year. One commodity that can be produced throughout the year is bananas. Banana production in South Sulawesi has increased significantly from year to year. In 2018, the production reached 136,099.50 tons, which will increase to 179,749.05 tons in 2022. Several regions, such as East Luwu, Luwu, Bulukumba, Wajo, Soppeng, Maros, Takalar, Pinrang, Sidrap, Jeneponto, and Bone, have expressed readiness for banana cultivation (5).

Bananas, especially cavendish, are a top priority because of their great potential as an export commodity and the opportunity to meet export demand from various countries. Cavendish bananas are widely cultivated in Indonesia and account for over 40% of world banana production (6). The culture of the people of South Sulawesi, which is very attached to bananas, also supports this (7).

This research focuses on exploring the potential and development opportunities of cavendish banana farming as a new flagship commodity in South Sulawesi and determining its economic viability. Cavendish banana (*Musa acuminata*) is a leading commodity with great economic potential in South Sulawesi. As an important horticultural commodity, this banana has high nutritional value and a broad domestic and international market. Its development can support the improvement of regional competitiveness through production efficiency and optimization of local resources, as stipulated in Law No. 23 of 2014 (Law/23, 2014) and Permendagri No. 9 of 2014. Cavendish bananas are suitable for planting in tropical areas with altitudes of up to 1,600 m above sea level and optimal temperatures of 29-30°C. The cultivation of this banana has the potential to increase farmers' income and create employment opportunities while contributing significantly to the country's foreign exchange through exports to various countries.

**II. LITERATURE REVIEW****A. Commodities**

The main objective of regional autonomy is to achieve people's welfare and quality of life. Law No. 23/2014 (8) provides for strengthening governance through improved public services and increased competitiveness. A region's competitiveness is encouraged to create added value through the efficiency of input factors to produce productive outputs. One approach to improving competitiveness is to develop a local economy based on regionally superior products.

Regional Leading Products (PUD) are regulated in the Minister of Home Affairs Regulation No. 9/2014 as products produced by cooperatives and small and medium-scale businesses that have the potential to be developed by utilizing all regional resources, both natural, human, and local culture. These products are expected to bring income to the community and government and be competitive in the global market (10).

A leading commodity is a product that has a competitive advantage because it has successfully overcome competition with similar products in other regions. This advantage is caused by high production efficiency and strong competitiveness against competitors, new entrants, and substitute goods (11). The criteria for superior commodities, according to the Directorate General of Regional Development of the Ministry of Home Affairs, include:

1. Prominent and innovative local content in agriculture, industry, and services.
2. High competitiveness in the market with characteristics, quality, competitive prices, and a broad marketing range.
3. Regional characteristics are important because they involve the local community.
4. Sufficient, stable, and sustainable availability of raw materials.
5. Focus on products with high added value.
6. It is economically beneficial and increases the community's income and human resource capabilities.
7. It is environmentally friendly, sustainable, and does not harm the local culture.

Developing superior commodities in the food crop subsector production center area can increase the effectiveness and efficiency of community economic activities and Gross Regional Domestic Product (GRDP) in the agricultural sector (12). Comparative and competitive advantages enable the production of superior commodities at relatively low cost, supported by the abundant potential of natural resources in the area (13).

**B. Farming**

Farming is a system that involves natural elements, labor, and capital with the primary objective of production in the agricultural sector. Farming science focuses on internal aspects such as organization, operations, financing, and sales, viewing farms as production units within the context of the overall organization (14).

Farming started as a subsistence activity to meet the food needs of the farming family but has turned into a commercial activity as the needs of life increase. These activities include land cultivation, planting, tending,

harvesting crops, and managing animals to produce food, feed, fiber, industrial raw materials, and income. Farming plays an important role in the economies of many countries, providing food and raw materials for industry (15).

Farm income is the difference between revenue and all costs. Gross farm income is the value of total products in a given period, while total expenditure is the value of all inputs used up in production. Net income is the difference between gross income and total expenditure (16).

Farming costs are divided into fixed costs and variable costs. Fixed costs are independent of the production level, while the production amount influences variable costs.

Costs can also be categorized as explicit costs (those incurred in production) and implicit costs (costs that must be considered even though they are not paid). In addition, costs can be cash and imputed, such as the use of family labor and depreciation of farm implements.

### **C. Potential of Cavendish Banana (*Musa acuminata*)**

Bananas originated in Southeast Asia and have become a staple food in many tropical countries. The Cavendish banana (*M. acuminata*) is a popular tropical fruit in Indonesia, better known as the white ambon banana (17).

Cavendish bananas are rich in nutrients, such as vitamin C, B6, potassium, fiber, and carbohydrates. The natural sugar content makes them a good energy source and provides health benefits such as improved digestion, blood pressure regulation, and support for cardiovascular and nervous system health (18).

Cavendish banana plants can grow well in the tropics, both in the lowlands and highlands, with a maximum altitude of 1,600 m above sea level. The optimum temperature for growth ranges from 29 to 30 degrees Celsius, with rainfall of 2000 to 2500 mm per year. This plant likes fertile soil with high humus content and clay below 40% (19).

Cavendish banana has high economic value and great market potential in domestic and international markets. Its development supports exports, investment, and economic equity through cooperation between the government, private sector, and farmers (20). Cultivating these bananas also creates local employment, supports the economic growth of producing regions, and opens up new business opportunities in diversifying processed products such as banana chips and juice. The economic potential of the Cavendish banana is evident in its contribution to exports, foreign exchange earnings, and support for farmer welfare and economic growth at local, national, and international levels. Innovation in product processing and sustainability of cultivation are key to strengthening the role of the Cavendish banana in supporting the economy.

### **III. METHODS**

The basic method used in this research is descriptive analysis, which focuses on solving current problems that are accurate and factual about the facts and properties of the population (21). The problem to be discussed in this research is the analysis of cavendish banana farming. Primary and secondary data are the sources of information

in this research. Data collection was done through observation and literature study. Data analysis includes data reduction, data presentation, inference, and conclusion.

#### IV. DISCUSSION AND RESULT

Banana cultivation is a promising business opportunity with relatively affordable capital and high profitability. Based on FS analysis of Cavendish Banana on 1 hectare of land in Makassar, this business has beautiful profit potential. With a population of 2,000 trees per hectare and an average productivity of 20 kg per tree, total production reaches 80,000 kg per year. With a selling price of IDR 4,500 per kg, the annual revenue reaches IDR 360 million per hectare. Initial investment costs amounted to IDR 114.3 million, and operational costs for the second year onwards amounted to IDR 52.5 million. Net profit in the first year reached Rp 208.8 million and increased to Rp 261.3 million in the second year.

The Internal Rate of Return (IRR) was recorded at 211.82%, which indicates outstanding investment feasibility. In addition, the net present value (NPV) reached IDR499, 483,112, reinforcing the conclusion that the project provides significant net benefits to investors. The payback period is also very short at only 0.5 years, indicating that the farm can recoup its capital in less than one year.

Realistic technical assumptions, such as a planting distance of 2 x 2.5 meters and a productivity target of 20 kg per tree, support this project's success. Harvesting is done twice a year by utilizing saplings as regeneration. This system allows for continuity of production without the need for additional costs for replanting the entire plantation.

However, some challenges and risks need to be considered. Dependence on market prices is one factor that affects profit margins. In addition, pest and disease control must be carried out consistently to maintain productivity. Other external factors, such as the availability of land and labor, may also affect the sustainability of this project. Apart from the financial aspect, the banana plant has added value from various parts of the tree. The stems can be used as animal feed or processed into fiber for clothing and paper. The leaves are often used as traditional food wrappers, while the banana peel can be processed into products such as vinegar. The banana heart also has economic value as food or organic fertilizer. Thus, in addition to generating direct profits from the fruit, banana cultivation provides a vast potential for product diversification. The following is an analysis of the Cavendish banana cultivation business.

#### Non crop investment (2 year land rental)

No.	Description	Need	Sat	Price per unit	Total IDR.
1	Land lease	1	Ha		-

## Research Article

### Plant Investment Year 1

No.	Description	Need	Sat	Price per unit	Total IDR.
1	Cavendish	1	Ha	114,300,000	114,300,000
					<b>114,300,000</b>
<b>Total Investment</b>					<b>114,300,000</b>

### Feasibility Analysis

<b>Planting Area</b>	1	Ha
<b>Type Composition</b>		
Cavendish	1	Ha
Population per Ha	2000	Tree
Productivity per Tree	20	Kg
Weight per Box	13	Kg
Price per Box	58500	IDR

Description	Units	Year 1	Year 2	Year 3
<b>Production per Ha</b> Cavendish	Kg	80,000	80,000	80,000
<b>Total Production</b> Cavendish	Box	<u>6,154</u>	<u>6,154</u>	<u>6,154</u>
		6,154	6,154	6,154
<b>Selling Price (FOB Farm)</b> Cavendish	IDR/Box	58,500	58,500	58,500

## Research Article

Profit and loss					
Description	Unit	Year 1	Year 2	Year 3	
<b>Income</b>					
Cavendish	IDR	360.000.000	360.000.000	360.000.000	
		<b>360.000.000</b>	<b>360.000.000</b>	<b>360.000.000</b>	
<b>Production cost</b>					
Cavendish	IDR	114.300.000	52.500.000	52.500.000	
		<b>114.300.000</b>	<b>52.500.000</b>	<b>52.500.000</b>	
<b>Gross Profit</b>	<b>IDR</b>	<b>245.700.000</b>	<b>307.500.000</b>	<b>307.500.000</b>	
Land Rental	IDR	-	-	-	
Amortization	IDR	-	-	-	
<b>Operating Profit</b>	<b>IDR</b>	<b>245.700.000</b>	<b>307.500.000</b>	<b>307.500.000</b>	
Corporate Income Tax	IDR	36.855.000	46.125.000	46.125.000	
<b>Net Profit</b>	<b>IDR</b>	<b>208.845.000</b>	<b>261.375.000</b>	<b>261.375.000</b>	
		<b>58%</b>	<b>73%</b>	<b>73%</b>	
<b>DCF</b>	<b>Unit</b>	<b>Year 0</b>	<b>Year-1</b>	<b>Year-2</b>	<b>Year-3</b>
Investment	IDR	(114.300.000)	(114.300.000)	-	-

## Research Article

Nett Profit	IDR		360.000.000	261.375.000	261.375.000
Amortisasi	IDR	-	-	-	-
Free Cash Flow	IDR	(114.300.000)	245.700.000	261.375.000	261.375.000
Discount Rate	%	12,00%	12,00%	12,00%	12,00%
Discount Factor		1,00	0,89	0,80	0,71
PV From FCF	IDR	(114.300.000)	219.375.000	208.366.550	186.041.562
Cumulative PV	IDR	(114.300.000)	105.075.000	313.441.550	499.483.112
<b>Investment Criteria</b>					
<b>IRR</b>	%	<b>211,82%</b>			
<b>NPV</b>	Rp	<b>499.483.112</b>			
<b>Pay Back</b>	<b>Year</b>	<b>0,5</b>			

Agricultural operations encompass routine maintenance and care activities, such as fertilizer application, pest control, and irrigation, which are crucial in achieving the desired productivity targets. These practices support optimal crop growth and contribute to the sustainability of harvest outcomes. Moreover, agricultural business plans are often designed with the assumption of two harvest cycles per year. This approach aims to maintain cash flow stability and ensure a consistent supply of products to meet market demand continuously. Such strategies form an essential foundation for efficient and market-oriented farm management.

## V. CONCLUSIONS

Ease of cultivation is another advantage. Banana plants are relatively resistant to environmental conditions and require minimal maintenance. Plant nutrients are provided through manure, and weed and pest control is simple. The irrigation process can also be handled with a simple line system, controlling operational costs. Considering all these aspects, banana farming is a business option that is profitable and sustainable, providing economic and environmental benefits simultaneously.

Cavendish banana cultivation in South Sulawesi is a highly profitable business opportunity with high-profit potential, fast payback rates, and manageable risks. The high IRR and NPV and a payback period of only 0.5 years indicate that the business is beautiful to investors and local farmers. Potential profits can be maximized with optimal management of resources such as land, labor, and agricultural inputs. To maintain business

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