

Strategy for The Development of Cilembu Yam in Tegal Regency

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KEYWORDS	ABSTRACT
Development Strategy, Sweet Potato, cultivation and marketing	Cilembu sweet potatoes, a high-value crop in Indonesia, have seen significant expansion in Tegal Regency, yet face challenges in productivity and market competitiveness. This study aims to (1) identify driving and inhibiting factors for Cilembu sweet potato development and (2) formulate a SWOT-based strategy to enhance cultivation and marketing. A mixed-methods approach was employed, combining surveys of 84 farmers and FGDs with stakeholders (farmers, traders, government) in Bojong and Bumijawa Districts. Data were analyzed using descriptive statistics and SWOT analysis. Key drivers include favorable growing conditions, low production costs, and government support, while barriers include uneven product quality and climate risks. SWOT analysis placed the crop in Quadrant I (strengths/opportunities), recommending aggressive strategies like farmer collaboration, standardized cultivation protocols, and product diversification. The study provides actionable insights for policymakers and farmers to optimize Cilembu sweet potato agribusiness, emphasizing the need for training, technology adoption, and market linkages. Future research should assess the economic feasibility of these strategies and their scalability to other regions.

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Introduction

Indonesia has abundant natural resources, including in the agricultural sector. Agriculture has a strategic role, especially as a food provider for the Indonesian people. Agriculture makes a real contribution to the supply of food, industrial raw materials, bioenergy, and labor absorption which has an impact on reducing poverty rates. Agricultural development needs serious attention from all parties. Agricultural development makes a very important contribution to the country's economic development and helps drive economic activities (Kusumaningrum, 2019).

Indonesia as an agrarian country has a variety of agricultural commodities, both commodities to meet the demand of the local market and the export market. Sweet potatoes with their various advantages are one of the commodities that need to be developed in Indonesia. The increasing demand for the export market from year to year is one of the strong reasons for developing sweet potatoes in Indonesia. The demand for tubers in foreign markets in the last ten years has shown an upward trend. Japan, which is one of the destination countries for tuber exports, has experienced an increase in demand of 15.6% per year (ITPC, 2020). Other countries that have become the

destination of sweet potato exports so far include Singapore, Malaysia, Hong Kong, South Korea and others.

Sweet potatoes are root crops that have great potential to be developed in Indonesia in general and in Tegal Regency in particular. Sweet potatoes seen from the cultivation side have advantages, including good adaptability to small-scale agricultural systems (Odongo et al., 2015), low production costs, resistant to water drought and even with limited inputs can still produce. Sweet potatoes can be planted in lowlands or highlands, but if planted in highlands, they will produce better bulbs compared to lowlands (Hermanto et al., 2019).

Sweet potatoes have a high nutritional content (Gopalakrishnan et al., 2011) and are suitable for consumption by diabetics (Widowati, 2011). The content of beta carotene as provitamin A, anthocyanins and phenols as antioxidants, as well as dietary fiber and relatively low glycemic index provide added value for sweet potatoes as a functional food (Ginting et al., 2014). By consuming sweet potatoes regularly, a person will get a number of nutrients that are important for maintaining a healthy body. This diverse nutritional content makes sweet potatoes a good food choice as part of a balanced diet and support a healthy lifestyle.

At this time, the development of sweet potatoes in Tegal Regency has increased very significantly. Based on data (BPS Central Java, 2023), it can be seen that Tegal Regency's sweet potato production data has increased significantly in 2021. In 2020, the area of sweet potato land in Tegal Regency was 76.9 Ha and increased in 2021 to 289.1 Ha. Based on information from the agricultural statistics officer of the Tegal Regency Food Security and Agriculture Office, it was recorded that 99% of the sweet potato planting area data in 2021 came from Bojong and Bumijawa Districts, the majority of which cultivated Cilembu sweet potatoes. The development of Cilembu sweet potatoes in Tegal Regency in 2021 can indirectly increase the economic activity of the community.

Of the many varieties of sweet potatoes in Indonesia, the Cilembu variety sweet potato is very interesting to research because Cilembu sweet potato has several advantages. Sweet potatoes with the Cilembu variety are considered beneficial for farmers (Handani & Trimo, 2021). Cilembu sweet potato varieties were chosen because of the high demand for local markets and exports coupled with the increasing public interest in Cilembu sweet potatoes because of their delicious and sweet taste.

The development of Cilembu sweet potatoes in Tegal Regency in recent years needs to be maintained and improved again. The productivity of Cilembu sweet potato in Tegal Regency is currently very likely to be increased because the Cilembu sweet potato variety has the potential to yield up to 20 tons per hectare (Ramli et al., 2010) while the current productivity according to farmer information is around 12.5 Tons/Ha. The yield of Cilembu sweet potatoes by farmers in Tegal Regency when for export the percentage that can be accepted as an export commodity is still low, because the shape and size are still not in accordance with the demand of the export market.

Cilembu sweet potato farmers at the time of selling sweet potatoes are still selling by slashing them, so there can be potential losses on one of the parties. At the time of losses experienced by traders, it will often affect the trader's price offer which is getting lower in the next harvest season. When losses are experienced by farmers, it will result in farmers' interest in planting to decrease.

This research aims to identify the driving and inhibiting factors for the development of Cilembu sweet potatoes in Tegal Regency and to determine an appropriate development strategy using SWOT analysis, with the theoretical benefit of serving as a reference for future studies on agricultural product development and the practical benefit of providing actionable recommendations for farmers, businesses, and stakeholders to enhance Cilembu sweet potato

cultivation in the region. The current research introduces novelty by specifically focusing on the development strategy of Cilembu sweet potatoes in Tegal Regency, a region with unique agro-climatic suitability for this variety, unlike prior studies that broadly address sweet potato cultivation or focus on other regions like Sumedang (Ramli et al., 2010; Handani & Trimo, 2021). It employs a mixed-methods approach (quantitative surveys and qualitative FGDs) to comprehensively analyze driving and inhibiting factors, a methodological advancement compared to singular-method studies (Sugiyono, 2016). Additionally, this study identifies nine distinct driving factors (e.g., government policy support, high market demand) and nine inhibiting factors (e.g., slash-based sales, climate change), providing a more granular SWOT analysis than earlier works (Rangkuti, 2015). The strategic recommendations, such as farmer group collaboration and SOP development for cultivation, are tailored to Tegal's context, addressing gaps in localized policy implementation (Permendes PDPT RI, 2023) and youth engagement, which were underexplored in previous research (Tanjung et al., 2023).

Materials and Methods

This study employs a mixed-methods approach, combining quantitative surveys and qualitative interviews, including Focus Group Discussions (FGDs), to analyze the development strategy of Cilembu sweet potatoes in Tegal Regency. The research focuses on key villages in Bojong and Bumijawa Districts, selected based on the concentration of sweet potato farmers and land suitability. The sample includes 533 farmers, chosen via probability sampling (Simple Random Sampling) for surveys, while purposive sampling selects informants (farmers, traders, and government officials) for FGDs. Data collection involves questionnaires, field observations, in-depth interviews, FGDs, and documentation, supplemented by secondary data from publications and records. Analysis uses descriptive statistics to summarize survey data and SWOT analysis to formulate development strategies. The findings aim to identify key factors influencing Cilembu sweet potato cultivation and provide actionable insights for stakeholders.

Results and Discussions

Tegal Regency Overview

Tegal Regency, which is located in Central Java Province with its capital in Slawi, has an area of 983.9 km² and consists of 18 sub-districts, including Bojong and Bumijawa which have great potential in Cilembu sweet potato cultivation. This cultivation has started to develop since 2021 due to the attractiveness of high income and low production costs compared to other commodities. Bojong and Bumijawa districts each have significant agricultural land areas, and most farmers have started using simple technologies such as tractors and single-row bed systems. However, the use of organic fertilizers is still limited although some young farmers, such as in Tuwel Village, have implemented it alongside the use of plastic mulch to increase productivity. Sweet potato seeds are mostly from Sumedang or inherited locally, with planting and maintenance predominantly done by female workers. Marketing of Cilembu sweet potatoes is still largely carried out on a slash basis, but farmer groups such as Istanaerang are beginning to play a role in maintaining price stability and expanding marketing to export, as well as encouraging the growth of local stalls and traders. The overall cultivation activities to the distribution of Cilembu sweet potatoes show a positive contribution to the local economic movement and make Cilembu sweet potato a location-specific superior product in Tegal Regency.

Descriptive Statistical Analysis

The descriptive statistical analysis conducted in this study focuses on the income obtained by Cilembu sweet potato farmers. The selection of this income-focused analysis was carried out because based on the results of interviews with average farmers, when asked to answer their productivity, many had difficulties because the average was sold by slashing on the land.

Cilembu Yam Development Strategy

The development of Cilembu sweet potatoes in Tegal Regency has strengths, weaknesses, opportunities and threats, so it is necessary to develop a strategy for the development of Cilembu sweet potatoes in order to provide benefits for farmers. A series of major actions directed to achieve long-term goals (Tjiptono, 1995) need to be prepared together in order to produce a strategy that is in accordance with the existing conditions in Tegal Regency. In an effort to formulate a strategy for the development of Cilembu sweet potatoes in Tegal Regency, a survey has been conducted to 84 Cilembu sweet potato farmers and a focus group discussion (FGD) involving representatives from traders, farmers, and the government. From the survey and FGD activities, everything that affects the development of Cilembu sweet potatoes in Tegal Regency is produced, internal factors and external factors are used to determine strategies using SWOT analysis.

Factors Driving and Inhibiting the Development of Cilembu Yams

From the survey activities that have been carried out on 84 respondents and FGDs involving the main actors, business actors and the government, several factors that affect the development of sweet potatoes in Tegal Regency were obtained. Broadly speaking, the factors that affect the development of Cilembu sweet potatoes can be grouped into driving factors and inhibiting factors for the development of Cilembu sweet potatoes in Tegal Regency.

The factors driving the development of Cilembu sweet potatoes in Tegal Regency include:

- 1) High profit: In recent years, Cilembu sweet potato farmers have received good prices, ranging from Rp 3000.00 to Rp 5000.00 per kilogram so that based on the survey results, an average income of Rp 19,001,954.00 per hectare was obtained. From the survey data, it can also be seen, it turns out that there are those who can get an income of Rp 45,000,000.00 per hectare. This means that from the average income value of IDR 19,001,954.00, farmers can still increase their income. When the income from Cilembu sweet potato cultivation is compared to the commodity that is usually grown by farmers in general, namely rice, according to the admission of some farmers, it turns out that it is more profitable to grow Cilembu sweet potato. When compared to rice crops, the income from planting Cilembu sweet potatoes is considered more profitable for farmers (Tanjung et al., 2023). The average production for rice plants is around 5,387 tons/Ha (BPS Central Java, 2023) with the average GKP price recently around IDR 5500 with production costs per hectare reaching IDR 18,000,000, so the profit rate of rice farmers is only around IDR 11,628,500.00 per hectare. In terms of the risk of crop failure, for Cilembu sweet potato plants, the risk of crop failure is smaller than rice commodities with various pest and disease attacks and existing weather conditions.
- 2) The suitability of the region that produces the distinctive taste of Cilembu Yam: Not all regions can produce sweet and honey sweet potatoes, only certain locations can produce a typical sweet and honeyed taste (Restuono, 2020). Tegal Regency, according to information from agricultural statistical data compiled by the Tegal Regency Agriculture

and Food Security Office, there are two sub-districts that have potential for sweet potato commodities, namely Bojong and Bumijawa Districts. Bojong and Bumijawa Districts which have locations with an altitude between 800 meters above sea level and 1000 meters above sea level are ideal areas for Cilembu sweet potato commodities (Ramli et al., 2010).

- 3) Ease of cultivation: In general, Cilembu sweet potatoes are very easy to cultivate by farmers because with simple care they can produce sweet potatoes. For farmers who want to apply maximum care, they can get promising results. The results of the survey that have been carried out show that there is a difference between farmers who provide optimal care and ordinary care. One of the factors is the difference in the benefits obtained by Cilembu sweet potato farmers in Tegal Regency is the treatment of farmers when cultivating Cilembu sweet potatoes in addition to the way Cilembu sweet potatoes are sold and climate factors.
- 4) There are farmer groups that are experienced in marketing: One of the key factors of success in agribusiness is marketing that can run smoothly. The existence of farmer groups that can market both for the local market and for export is certainly a very important thing for its existence to be developed. Farmer groups that play a role in the marketing of Cilembu sweet potatoes can play a role in maintaining price stability at the farmer level from the game of traders who only care about personal profits. The stability of the price of Cilembu sweet potatoes at the farmer level will indirectly maintain the interest of farmers to continue planting Cilembu sweet potatoes and will even grow like the phenomenon that exists in Tegal Regency at this time. In terms of empowerment, farmer groups can absorb labor for post-harvest storage.
- 5) Low cost of Cilembu sweet potato production: When compared to other commodities in general such as rice and corn, the production cost of Cilembu sweet potato is relatively lower. The production cost of Cilembu sweet potatoes per hectare based on the survey results is around Rp 12,000,000.00 to Rp 18,000,000.00. The small cost of production of Cilembu sweet potatoes is often an alternative for farmers when experiencing limited capital so that it can be applied to small-scale agriculture (Odongo et al., 2015) and has high profit potential. High profits will be an attraction for other farmers to plant Cilembu sweet potatoes.
- 6) High market demand: The local and export markets are still wide open for Cilembu sweet potatoes, especially with the increasing awareness of a healthy lifestyle, one of which can be obtained from the consumption of sweet potatoes due to their high nutritional content (Gopalakrishnan et al., 2011). Based on information from farmer groups that usually supply exporters, it is said that so far there are still many requests from exporters that have not been met due to existing production limitations.
- 7) Government policy support: The existence of a food security fund and the development of local economic potential (Permendes PDTT RI, 2023) allocated from village funds provides opportunities for the development of Cilembu sweet potatoes in Tegal Regency.

Development can be in the form of farmer coaching, cultivation techniques and post-harvest handling.

- 8) Developing cultivation technology: Over time, the application of cultivation technology needs to be applied by farmers to be able to increase productivity. Technological advancements help to increase productivity and product quality which can ultimately increase revenue. The use of technology such as the use of mulching, balanced fertilization, superior varieties and others can increase productivity (Prasetiaswati et al., 2022).
- 9) Variety of processed products: Cilembu sweet potatoes, in addition to being consumed directly by steaming, frying and being ovened, can also be processed into various processed products. Cilembu sweet potatoes can be processed into various contemporary preparations. Some of the various processed foods derived from sweet potatoes include steamed sponges, white bread, sweet potato noodles, sweet potato sticks, sweet potato jam, ice cream and sweet potato sauce (Pratiwi, 2020).

The factors inhibiting the development of Cilembu sweet potatoes in Tegal Regency include:

- 1) Limitations of tools and machines: The limited workforce engaged in agriculture can hinder the cultivation process. Agricultural tools and machinery are one of the alternatives to overcome the limitations of human labor. On the other hand, the existence of agricultural tools and machinery for Cilembu sweet potato cultivation in Tegal Regency is still very limited. On average, farmers still use a lot of human labor in land cultivation.
- 2) Capital limitations: Many farmers have difficulty getting funds to scale their businesses.
- 3) Uneven product quality: Variations in the quality of crops are still a problem that can reduce competitiveness in the market.
- 4) Low use of organic matter: Agricultural practices that are still dominant using chemicals and even some without fertilizer will reduce the carrying capacity of the land at all. Slowly, when there is no provision of organic matter to agricultural land, productivity will decrease, which will ultimately have an impact on the profits obtained by farmers.
- 5) Slash-based sales: This sales system often disadvantages farmers because prices are unilaterally determined by middlemen.
- 6) Competition with other districts: The existence of other regions that also produce Cilembu sweet potatoes creates fierce competition, both in the local and export markets.
- 7) Climate change: Unpredictable weather conditions can disrupt land productivity and crop yields.
- 8) Price game by traders: Traders often play up prices, which can be detrimental to farmers, especially those who do not have direct access to the market. When traders provide low prices which results in a decrease in the profits of Cilembu sweet potato farmers, it will have an impact on the motivation of Cilembu sweet potato farmers to plant Cilembu sweet potatoes again.
- 9) Varying grade demand: Exporters have different and specific quality standards.

SWOT Analysis

SWOT analysis is carried out to identify internal factors (strengths and weaknesses) and external factors (opportunities and threats) that can be used to develop a strategy for the development of the Cilembu sweet potato commodity.

Determination of Internal and External Factors

Internal factors are elements that are under the direct control of Cilembu sweet potato farmers in Bojong and Bumijawa Districts. These internal factors relate to resources, capabilities, and weaknesses. Internal factors consist of strengths and weaknesses. Strength is a positive aspect that becomes a competitive advantage. Weaknesses are negative aspects that hinder performance or goals. Internal factor analysis will be used as material to identify strengths and weaknesses to develop a strategy for the development of Cilembu sweet potatoes in Tegal Regency.

From the results of the discussion, it was agreed that several strengths and weaknesses were in order to develop a strategy for the development of Cilembu sweet potatoes in Tegal Regency. The strengths that exist in Cilembu sweet potato farmers in Tegal Regency include: 1) The existence of farmers who are able to cultivate with high yields, 2) The production cost of Cilembu sweet potatoes is lower than other main commodities, 3) The taste of Cilembu sweet potatoes that are widely liked by the community, 4) Soil that is suitable for Cilembu sweet potato cultivation, 5) The existence of farmer groups that are able to carry out local marketing and exports, 6) Long shelf life, 7) Cilembu sweet potato is easy to cultivate. The agreement on the weakness factors in the context of the preparation of the Cilembu sweet potato development strategy in Tegal Regency includes: 1) Limited alsintan for Cilembu sweet potato cultivation, 2) Limited labor, 3) Sales are still carried out on a slash basis, 4) The use of organic materials is still low, 5) The low number of young farmers engaged in agriculture, 6) Limited capital, 7) The quality of Cilembu sweet potato products is still uneven.

External factors include elements that are beyond the direct control of Cilembu sweet potato farmers. These external factors are influenced by broader environmental conditions, both opportunities and threats to the development of Cilembu sweet potatoes in Tegal Regency. Opportunity is an external condition that can be used to support the development of Cilembu sweet potato in Tegal Regency. Threats are external conditions that can be an obstacle to the success of the development of Cilembu sweet potatoes in Tegal Regency. From the results of the discussion, it was agreed that several opportunities and obstacles to the development of Cilembu sweet potatoes in Tegal Regency were agreed. Opportunities that exist for the development of Cilembu sweet potatoes in Tegal Regency include: 1) Local market and export opportunities that are still high, 2) Government policies related to food security funds of 20% of village funds, 3) Awareness of healthy lifestyles, 4) Advances in cultivation technology, 5) Variety of processed products from sweet potato raw materials. The threats that are felt to exist for the development of Cilembu sweet potatoes in Tegal Regency include: 1) Varying grade demand from exporters, 2) The existence of competitors for Cilembu sweet potatoes in other areas, 3) Pests and diseases, 4) Uncertain climate change, 5) Pricing of Cilembu sweet potatoes.

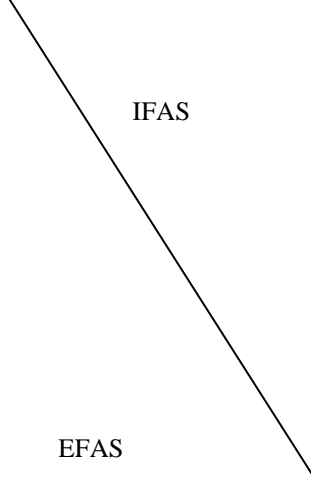
Weight, Rating and Score Determination

The results of the identification of internal and external factors to develop a strategy for the development of Cilembu sweet potatoes in Tegal Regency were then given weight, ratings and scores. The determination of weight, rating and score of internal factors is presented in Table and external factors are presented in **Error! Reference source not found.** In detail, the level and rating values can be seen in appendix 4.

Table 1. Determination of weight, rating and score of internal factors

INTERNAL					
Strength	The factors	Level	Weight	Rating	Score
	The existence of farmers who are able to cultivate with high yields (S1)	4	0.19	8	1.52
	The production cost of Cilembu sweet potatoes is lower than other main commodities (S2)	2	0.10	7	0.67
	The taste of Cilembu sweet potato that is widely liked by the public (S3)	4	0.19	6	1.14
	Suitable soil for Cilembu sweet potato cultivation (S4)	5	0.24	8	1.90
	The existence of farmer groups that are able to carry out local marketing and exports (S5)	3	0.14	6	0.86
	Long shelf life of sweet potatoes	3	0.14	5	0.71
		21	1		6.81
Weakness		Level	Weight	Rating	Score
	Limitations of alsintan for Cilembu sweet potato cultivation (W1)	2	0.09	4	0.36
	Labor limitations (W2)	3	0.14	7	0.95
	Sales are still being carried out by slash (W3)	2	0.09	3	0.27
	Utilization of organic matter is still low (W4)	5	0.23	8	1.81
	Low number of young farmers engaged in agriculture (W5)	3	0.14	3	0.41
	Capital limitations	4	0.18	4	0.73
	The quality of Cilembu sweet potato products is still uneven	3	0.14	7	0.95
		22	1		5.5
				S-W	1.31

SWOT Matrix

	Strength	Debilitation
	<p>The existence of young farmers who are able to cultivate with high yields (S1)</p> <p>The production cost of Cilembu sweet potatoes is lower than other main commodities (S2)</p> <p>The taste of Cilembu sweet potato that is widely liked by the public (S3)</p> <p>Soil suitable for the cultivation of cilembu sweet potatoes (S4)</p> <p>The existence of farmer groups that are able to carry out local marketing and exports (S5)</p> <p>Long shelf life of sweet potatoes</p> <p>Cilembu tubers are easy to cultivate</p>	<p>1. Limitations of alsintan for Cilembu sweet potato cultivation (W1)</p> <p>2. Labor limitations (W2)</p> <p>3. Sales are still being carried out by slash (W3)</p> <p>4. Utilization of organic matter is still low (W4)</p> <p>5. Low number of young farmers engaged in agriculture (W5)</p> <p>6. Capital limitations (W6)</p> <p>7. The quality of Cilembu sweet potato products is still uneven. (W7)</p>
Chance	N-O	W-O
<p>1. Still high local market and export opportunities (O1)</p> <p>2. Government policy related to food security fund 20% of village funds (O2)</p> <p>3. Healthy lifestyle awareness (O3)</p> <p>4. Technological advances in cultivation (O4)</p> <p>5. Variations of processed products from sweet potato raw materials (O5)</p>	<p>1. Encouraging the realization of cooperation between farmer groups and farmers to meet existing market opportunities (S5, O1)</p> <p>2. There are training activities for Cilembu sweet potato farmers and the preparation of SOPs for Cilembu sweet potato cultivation. (S1, S5, O2, O4).</p> <p>3. Utilizing land suitability and low production costs to apply cultivation technology to meet local and export market opportunities (S5, O1, O2, O5)</p> <p>4. Branding about the delicious taste of sweet potatoes by bringing out a variety of processed products so that they are maintained by people who already have awareness of a healthy lifestyle. (S3, O5 O3)</p> <p>5. Taking advantage of the storage capacity of sweet potatoes that are long enough to be processed into various processed foods. (S6, O5)</p>	<p>1. Using village funds to overcome the limitations of alsintan and manpower (O2, W1 W2)</p> <p>2. Increase public awareness to use technology and organic materials that can affect the quality of sweet potatoes so that farmers can sell according to grade at a better price to meet export opportunities. (O4, W4 W7)</p> <p>3. The realization of processed products from Cilembu sweet potato raw materials that are not in sales grade (W7, O5)</p>
Threat	ST	WT
<p>1. Varying grade requests from exporters (T1)</p> <p>2. There are competitors for Cilembu sweet potatoes in other areas (T2)</p> <p>3. Pest disease infestation (T3)</p> <p>4. Volatile Climate Change (T4)</p> <p>5. Pricing of Cilembu tubers by traders (T5)</p>	<p>1. Together with the farmer group, encouraging farmers who are already able to produce high productivity to conduct trials to meet the specifications for export (S1, S5, T1)</p> <p>2. Increasing the role of farmer groups to educate farmers about varying export grades to face competition from Cilembu sweet potato farmers in other regions and suppressing the</p>	<p>1. Improving cultivation techniques and sales patterns of Cilembu sweet potato farmers to meet the demand for export grads, competition with Cilembu sweet potatoes in other regions and dealing with sweet potato pricing that often harms farmers (W4 W7, T1 T2 T5)</p> <p>2. Increasing the role of the government to disseminate good cultivation techniques, pest and disease handling and marketing (W5, T1 T3)</p>

- pricing of Cilembu sweet potatoes by traders. (S5, T1, T2, T5)
3. With low production costs and land suitability, it is still possible for farmers to be able to make a profit even though they need to escort pest and disease attacks, especially during the rainy season. (S2 S4, T3 T4)
 4. Increasing the spread of branding that has a long shelf life and the taste of delicious sweet potatoes produced in the tegal area due to the suitability of the land to face competition with Cilembu sweet potatoes in other regions (S3 S6, T2)
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The formulation of strategies in efforts to develop Cilembu sweet potatoes in Tegal Regency consists of:

S-O Strategy (*agresive strategy*)

Utilizing the existing elements of strength from the internal to take advantage of existing opportunities, the strategy is:

Encouraging the realization of cooperation between farmer groups and farmers to meet existing market opportunities (S5, O1)

There are training activities for Cilembu sweet potato farmers and the preparation of SOPs for Cilembu sweet potato cultivation. (S1, S5, O2, O4).

Utilizing land suitability and low production costs to apply cultivation technology to meet local and export market opportunities (S5, O1, O2, O5)

Branding about the delicious taste of sweet potatoes by bringing out a variety of processed products so that they are maintained by people who already have awareness of a healthy lifestyle. (S3, O5 O3)

1. Taking advantage of the storage capacity of sweet potatoes that are long enough to be processed into various processed foods. (S6, O5)

S-T Strategy (*diversivication strategy*)

The existing elements of strength are used to overcome external threats that hinder the development of Cilembu sweet potatoes in Tegal district, in quadrant II. The recommended strategies are:

1. Together with farmer groups, encouraging farmers who are already able to produce high productivity to conduct trials to meet the specifications for export (S1, S5, T1)
2. Increasing the role of farmer groups to educate farmers about varying export grades to face competition from Cilembu sweet potato farmers in other regions and suppressing the pricing of Cilembu sweet potatoes by traders. (S5, T1, T2, T5)

3. With low production costs and land suitability, it is still possible for farmers to be able to make a profit even though they need to escort pest and disease attacks, especially during the rainy season. (S2 S4, T3 T4)
4. Increase the spread of branding that has a long shelf life and the taste of delicious sweet potatoes produced in the tegal area because of the suitability of the land to face competition with Cilembu sweet potatoes in other regions (S3 S6, T2)

W-O Strategy (*turn-around strategy*)

Some of the weaknesses and opportunities for the development of Cilembu yams in quadrant III show strategies to suppress existing weaknesses by taking advantage of available opportunities. The recommended strategies are as follows:

W-O

1. Using village funds to overcome the limitations of alsintan and labor (O2, W1 W2)
2. Increase public awareness to use technology and organic materials that can affect the quality of sweet potatoes so that farmers can sell according to grade at a better price to meet export opportunities. (O4, W4 W7)
3. The realization of processed products from Cilembu sweet potato raw materials that are not included in the sales grade (W7, O5)

W-T Strategy (*defensive strategy*)

The position in quadrant IV is the most unfavorable position because of the weaknesses and threats that bind together. However, there are still strategies that are expected to suppress weakness as an effort to avoid all threats. Strategies that can be recommended are:

1. Improving cultivation techniques and sales patterns of Cilembu sweet potato farmers to meet the demand for export grads, competition with Cilembu sweet potatoes in other regions and dealing with the pricing of sweet potatoes that often harm farmers (W4 W7, T1 T2 T5)
2. Increase the role of the government to disseminate good cultivation techniques, pest and disease handling and marketing (W5, T1 T3)

There are several strategic recommendations for the development of Cilembu sweet potatoes in Tegal Regency, including:

Encouraging the realization of cooperation between farmer groups and farmers.

Encourage the preparation of SOPs for Cilembu sweet potato cultivation involving the government, farmers, traders and researchers.

Conducting training activities on the cultivation and marketing of Cilembu sweet potatoes using the village fund budget.

Strengthening farmer institutions engaged in marketing with capital loans from the village government.

1. Encouraging the realization of various processed Cilembu sweet potato raw materials.

Conclusion

This research identifies key drivers (e.g., favorable growing conditions, market demand, government support) and barriers (e.g., limited capital, climate risks, uneven quality) in Cilembu sweet potato development in Tegal Regency, using SWOT analysis to position the crop in Quadrant I (high strengths/opportunities), recommending aggressive strategies such as farmer collaboration, standardized cultivation protocols, training programs, and product diversification. Future studies should assess the economic feasibility of these strategies, evaluate climate and market risks, compare practices with other regions, analyze policy impacts, and explore adoption challenges to ensure sustainable development.

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