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Analysis of Development Strategies for The Tempeh Industry Using Local Soybeans

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Abstract. The tempeh industry in Indonesia currently faces a critical dependency on imported soybeans, with approximately 80-90% of its raw material needs sourced from abroad. This reliance creates significant vulnerabilities to global price fluctuations and supply chain disruptions. While local soybean production remains underutilized, farmers are willing to increase output if provided with market assurance and competitive pricing. This study aims to analyze internal and external factors influencing the development of the tempeh industry using local soybeans and to formulate appropriate development strategies. Employing a descriptive analysis method with a case study approach, data were collected through questionnaires, interviews, observations, document studies, and focus group discussions involving key informants from Grobogan, Klaten, Sragen, and Sukoharjo regencies—major soybean and tempeh production centers in Central Java. SWOT analysis was utilized as the analytical technique. The results revealed that the tempeh industry is generally willing to use local soybeans provided they are consistently available in the market. Internal factor analysis yielded a score of 3.55 (strength score: 1.92, weakness score: 1.62), with a positive difference of 0.30. External factor analysis produced a score of 3.01 (opportunity score: 1.73, threat score: 1.27), with a positive difference of 0.46. Based on these findings, the tempeh industry must adopt an aggressive growth strategy to reduce import dependency, strengthen local supply chains, and enhance competitiveness through product innovation and market expansion. These findings suggest that integrated government-industry collaboration is essential for successful import substitution

Keywords: *Development strategy, food security, local soybeans, SWOT analysis, tempeh industry*

1. Introduction

The tempeh industry faces significant challenges due to its heavy reliance on imported soybeans. This dependency has led to price instability and supply chain vulnerabilities. The supply chain for soybeans is unstable, partly due to the lack of a regulatory body to manage it effectively. The absence of a buffering value chain regulator, previously managed by Bulog, has led to uncertainties and the presence of cartel systems [1].

In general in various regions, despite being a significant producer, still relies heavily on imported soybeans due to insufficient local production. This reliance affects local soybean prices and farmer motivation, leading to a cycle of low production and increased imports [2,3].

The tempeh industry relies heavily on imported soybeans, with approximately 80-90% of its soybean needs sourced from abroad. This dependence causes the cost of raw materials for tempeh highly susceptible to fluctuations in global soybean prices and international import policies, leading to unstable and rising production costs. Such a scenario poses a significant threat to the sustainability of the tempeh business, particularly for small and medium-sized enterprises that possess limited financial resilience. Conversely, the potential for local soybean production remains underutilized, primarily because the market has not consistently shown a commitment to utilizing domestically-produced soybeans. Local soybean farmers are willing to increase their output if there is considerable market assurance and stable demand from the tempeh industry. In other words, a dedicated market commitment to using local soybeans is essential to motivating farmers to boost production as a substitute for imported soybeans.

Without a clear strategy to secure market commitments and incentivize increased local soybean production, the dependence on imports may continue. This situation not only heightens the tempeh industry's vulnerability to global price fluctuations but also hampers the development of local agribusiness and undermines national food security.

Some of the results of previous research on the tempeh industry include strategies developing for small-scale tempeh industries. According to [4] , strategies such as product differentiation, improving product quality and packaging, and ensuring product legality supported by digital marketing are crucial for developing new tempeh products. These strategies help in meeting market demand and increasing profitability. Other research was conducted by [5], The results of the criteria weighting calculations are product development (0.1022), product quality (0.2747), continuity of product availability (0.2938), and consumer satisfaction (0.3293). Alternative strategies are classified into four types: the prospector strategy, the defender strategy, the analyzer strategy, and the reactor strategy. The calculation results indicate that implementing the defender strategy is a priority in the development of the Rumah Tempe business unit at RKG.

Meanwhile, research conducted by [6], found that strategies to develop the tofu and tempeh business in Longgat District, Central Lombok Regency, include increasing production volume, maintaining prices, and expanding market share. The obstacles faced by tofu and tempeh agro-industry entrepreneurs are increases in raw material prices and changes in the weather.

The results of the study by [7], show that the internal condition of the Mekarsari Industry has a value of 0.15. In contrast, the external condition of the Mekarsari Industry in Kebunsari Village shows a value of -0.045. The position of the Mekarsari Industry in Kebunsari Village is currently in the diversification strategy phase. This is evidenced by the internal and external SWOT matrix, which shows that the condition of the Industry is in quadrant 2, which is a relatively favourable situation. The Mekarsari Industry in Kebunsari Village has both threats and strengths, allowing it to optimize its internal strengths to avoid existing threats : 1. Utilizing the resources owned by the industry to minimize changes in increasing raw material prices, 2. Improving the quality of service to consumers and maintaining good temperature quality to be able to compete with other industries consistently.

The tempeh industry is a vital agro-industrial sector in Indonesia, and local soybeans have considerable potential to enhance food self-sufficiency and decrease reliance on soybean imports. However, there is currently limited research specifically focused on strategies to increase the use of local soybeans within the tempeh industry. Most existing studies address general topics related to tempeh production, product innovation, marketing, and business feasibility, without thoroughly exploring the challenges and opportunities associated with substituting local soybeans for imported ones in the tempeh production process.

Utilizing local soybeans can significantly increase the added value of tempeh products, strengthen local agriculture and the economies of soybean-producing regions, and promote the sustainability of the industry. Therefore, there is an urgent need for research to develop practical strategies and effective policies that encourage the use of local soybeans. Research addressing this gap will provide a meaningful contribution to strengthening an independent and sustainable national tempeh industry while supporting food security programs and local agribusiness development.

2. Research Methods

2.1 Research Approach

The research employs a descriptive analysis method, utilizing a case study approach. The methodology section outlines the process of using SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis for strategic planning. This approach helps organizations evaluate their internal and external environments to formulate effective strategies. In the beginning of research, we clearly specified the objective of the SWOT analysis. This could be to improve strategic planning, enhance competitive advantage, or optimize resource allocation [8].

2.2 Data Types and Collection Technique

We conducted various data collection technique such as questionnaires that to distributed to key stakeholders, including top and middle management, to gather insights on internal and external factors [9], interviews with decision-makers to obtain qualitative data, direct observation on organizational processes and environments to identify strengths and weaknesses, and Focus Group Discussion among groups of participants who share similar characteristics or experiences related to the research topic.

2.3 Internal and External Factors Analysis

We conducted internal factor analysis and external analysis. Internal Analysis was to identify and list the strengths and weaknesses within the organization. External Analysis was to Identify and list the opportunities and threats in the external environment [10].

2.4 Evaluation of Internal and External Factors

This involves weighting and rating and scoring for each factors through comparison matrices to determine their relative importance.

2.5 SWOT quadrant determination

Based on the evaluation results of internal and external factors, the SWOT square is determined by checking whether the coordinate points of these factors are in quadrants 1, 2, 3, or 4. The quadrant position will determine the general strategy that the tempeh industry must carry out.

2.6 Analysis, Interpretation and Strategy Formulation

Analyze the collected data to identify core competencies and core problems. Then distilling the strengths and the weaknesses into actionable insights [11], and focus on the most influential factors for strategic planning [12]. Formulate strategies that leverage strengths and opportunities while addressing weaknesses and mitigating threats. [13].

3. Results and Discussion

3.1 List and evaluation of Internal and external factor

The results of the identification and evaluation of internal and external factors of the tempeh industry development strategy using local soybeans are presented in Table 1.

Table 1. List and evaluation of Internal and external factor.

Internal factors - external factors	Weight	Rating	Score
Internal factors			
Strength			
Supply chain of raw material for tempeh	0,050	2	0,10
The nutritional value of tempeh	0,102	4	0,41
The ease of innovation of tempeh products, such as variations in shapes, flavours, and packaging	0,099	3,923	0,39
Established marketing network	0,085	3,384	0,29
Experience and expertise in the tempeh production process that has been passed down from generation to generation	0,158	3,076	0,49
Good product quality	0,078	3,076	0,24
Sub Total	0,57	19,459	1,92
Weakness			
The process of making tempeh takes a long time and is labour-intensive	0,069	2,692	0,19
The quality of local soybeans is not as good as imported soybeans, affecting the quality of the final product	0,083	3,23	0,27
Limited business capital and modest production equipment	0,081	3,153	0,25
Less business management skills	0,092	3,17	0,29
Product packaging is less attractive to consumers	0,098	3,846	0,38
No promotional activities	0,081	3,153	0,25
Sub Total	0,5	19,239	1,63
Total Internal Factors	1,0		3,55
Strength – Weakness Difference			0,29
External factors			
Opportunity			
The demand for the tempeh market continues to increase due to healthy food trends and high consumption of plant-based proteins	0,09	2,384	0,21
The number of soybean suppliers and the ease of distribution of tempeh products to various regions	0,13	3,384	0,43
Government support for the development of MSMEs and tempeh household industry	0,06	1,538	0,09
The potential for the development of new markets outside the region of origin and the expansion of tempeh products to a wider segment	0,13	3,461	0,45
Opportunities for product innovation and production technology to improve efficiency and quality	0,14	3,846	0,55
Sub Total	0,5	14,613	1,73
Threat	-		

Internal factors - external factors	Weight	Rating	Score
Volatility in the price of the main material (soybeans) that is uncertain and tends to increase	0,14	3,615	0,49
Fierce competition from other tempeh producers, both small-scale and large-scale industries	0,06	1,615	0,10
Food safety and halal certification issues that must be met to maintain consumer trust	0,06	1,692	0,11
Weather or climate changes that can affect the tempeh production process	0,14	3,615	0,49
Risk of tempeh being imported or tempeh patent claims by other countries that could threaten the local market	0,06	1,538	0,09
Sub Total	0,5	12,075	1,27
Total External Factors	1.0		3,01
Opportunity - Threat Difference			0,46

3.2. SWOT Quadrant

Based on the evaluation of internal and external factors, a general strategic decision was obtained that must be implemented by the tempeh industry. The quadrant position is presented in Figure 1.

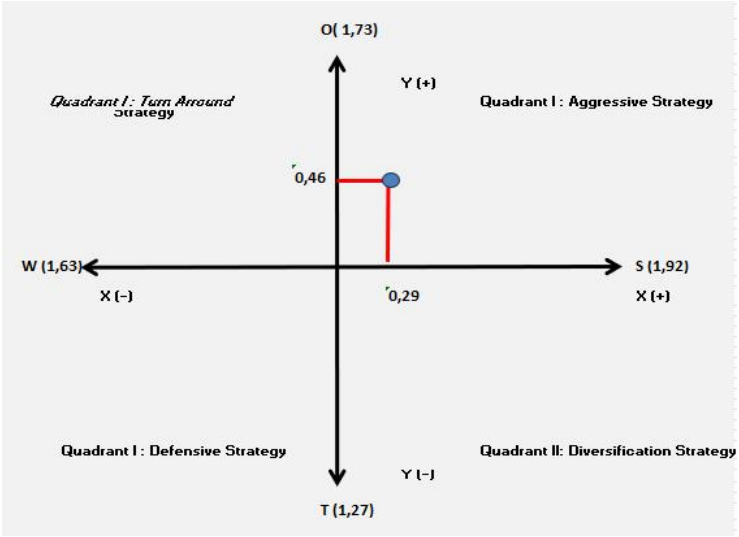

Figure 1. SWOT Quadrant

Based on the results of and Internal - External factor analysis & the SWOT Quadrant analysis, the business industry must adopt an Aggressive Strategy in running its business by utilizing local soybeans, thereby reducing its dependence on imported soybean raw materials. The tempeh industry possesses significant internal strengths, identifiable market opportunities, and adequate resources to facilitate expansion. Given these factors, the tempeh industry can adopt strategies to accelerate growth, broaden its markets, increase market share, and innovate its products and services.

There are any alternative strategy recommendations. One of the primary strategies is to strengthen local soybean production by collaborating tempeh industry with farmers to improve cultivation practices. In this case, the tempeh industry cannot operate alone but requires government support to increase local soybean production by farmers. Alternative strategies

that could be implemented include: providing training on modern agricultural techniques, pest management, and soil health to increase yield and quality, improving farmer motivation through setting competitive prices for local soybeans can encourage farmers to increase production [3], promoting the distribution and cultivation of new high-yield soybean varieties [14] and Implementing advanced agricultural technologies [15]. Government intervention is also crucial in setting favourable policies for local soybean pricing, providing subsidies, and supporting technological advancements [3,16]. Building a sustainable supply chain that prioritizes local soybean sourcing is essential for reducing dependency on imports. This involves establishing direct relationships with local farmers, ensuring fair pricing, and creating a reliable distribution network. By implementing several strategies to increase local soybean production, it is hoped that market supply will meet national soybean demand, making it accessible to the tempeh industry and other industries.

Furthermore, once the soybean availability issue is resolved, the tempeh industry must focus on using local soybeans as its raw material. The tempeh industry must anticipate changes in raw material prices following the use of local soybeans. Changes in raw material purchase prices are essential to incentivize farmers to grow soybeans in the future, thereby ensuring a secure local soybean supply. With these changes, the tempeh industry needs to implement various aggressive alternative strategies so that even if raw material prices increase, the industry can continue marketing and sales without reducing profits.

Some alternative strategies that can be implemented include: developing value-added products from local soybeans. This can include creating various tempeh flavours, snacks, or other soy-based products that appeal to different consumer segments. By innovating and expanding the product line, the industry can attract a broader customer base and increase demand for locally sourced soybeans. This strategy not only enhances profitability but also encourages the use of local ingredients in production.

An aggressive marketing campaign focused on the benefits of locally sourced soybeans can help shift consumer preferences away from imported products. Educating consumers about the nutritional advantages, environmental benefits, and support for local economies associated with locally produced tempeh can drive demand. Engaging in community outreach, social media campaigns, and partnerships with local health organizations can raise awareness and promote the consumption of locally sourced tempeh. This strategy can create a loyal customer base that values local products. In addition to soybean farmers, the tempeh industry also requires support and guidance from stakeholders. Continuous training and partnerships between local authorities, private stakeholders, and farmers can sustain advancements and improve the competitiveness of the tempeh industry [17]. The tempeh industry can also expand its marketing channels by building strategic partnerships with distributors and modern retailers to strengthen national and international market penetration.

4. Conclusions

Developing the tempeh industry using local soybeans requires a multifaceted approach and aggressive strategy that addresses issue of local soybean availability and business management. By ensuring soybean availability, the tempeh industry can achieve greater self-sufficiency and stability in raw material supply. The tempeh industry should collaborate with soybean farmers, who need government support to boost their production.

On the tempeh industry side, it is important to develop value-added products from local soybeans. By innovating and expanding the product line, the industry can attract a broader customer base and increase demand for locally sourced soybeans. Other strategy, the tempeh industry also can conduct an aggressive marketing campaign that focused on the benefits of locally sourced soybeans. It can help shift consumer preferences away from imported products.

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