

# Development Strategy of Farming: Chili (*Capsicum Annuum L*) Farming of South Sumatera, Indonesia

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## ABSTRACT

Chili is one of the fruits that are in high demand. Now many chili farmers complain about the falling price of chili in the market. Due to several problems, the researcher aims to analyze how the right strategy is to develop the chili business so that there is a balance in the market and farmers can get optimal profit. This study aimed to analyze the development of chili agribusiness using the SWOT analysis method to strengthen chili price stability. The study was conducted using two-month primary and secondary data—preliminary data obtained from direct observation and interviews with respondents based on the questionnaire. Secondary data were collected and obtained from the Department of Agriculture, and the Forestry Extension Implementing Agency, BPS. The sampling method used the purposive sampling method, as many as 42 samples from the total population in three districts in South Sumatera. The Sample taken is chili farmers who produce in 2021. Descriptive data analysis uses strengths, Weaknesses, Opportunities, and Threats (SWOT). Based on the research results, It can be concluded that the alternative Strength Opportunity (SO) strategies are as follows: Utilization of suitable climate and soil for chili cultivation can increase chili production, which is supported by supportive government regulations, by utilizing sophisticated technology will shorten land cultivation, maintenance, and processing of chili harvest.

Post-harvest technology will increase the shelf life of chili. With a short chili life, it will be shortened even more with sophisticated technology, a lot of chilies is harvested because the land area is also significant, the harvest can be processed into derivative products so that it can increase the selling value and shelf life and the need for agricultural products will not change according to its development, Utilization of suitable climate and soil for chili cultivation can increase chili production which is supported by supportive government regulations, by utilizing advanced technology will shorten land processing, maintenance, and harvesting of chili. Post-harvest technology will increase the shelf life of chili. With a short chili life, it will be shortened even more with sophisticated technology, a lot of chilies is harvested because the land area is also large, the harvest can be processed into derivative products so that it can increase the selling value and shelf life and the need for agricultural products will not change according to its development, Utilization of suitable climate and soil for chili cultivation can increase chili production which is supported by supporting government regulations, by utilizing advanced technology will shorten land cultivation, maintenance, and harvest of chili. Post-harvest technology will increase the shelf life of chili. With a short chili life, it will be shortened even more with sophisticated technology, and many chilies are harvested because the land area is also large, the harvest can be processed into derivative products so that it can increase the selling value and shelf life and the need for agricultural products will not change according to its development, Post-harvest technology will increase the shelf life of chili. With a short chili life, it will be shortened even more with sophisticated technology, and many chilies are harvested because the land area is also large, the harvest can be processed into derivative products so that it can increase the selling value and shelf life and the need for agricultural products will not change according to its development, post-harvest technology will increase the shelf life of chili. With a short chili life, it will be shortened even more with sophisticated technology, and many chilies are harvested because the land area is also large, the harvest can be processed into derivative products so that it can increase the selling value and shelf life and the need for agricultural products will not change according to its development.

**Keywords:** *chili farming, development strategy, SWOT*

## 1. INTRODUCTION

### 1.1. Background

Agricultural commodities in Indonesia are very diverse and have an important role in realizing food sovereignty and security. Agricultural commodities need a strategy in their development because most agricultural commodities in Indonesia are commodities that are the community's basic needs. One of the agricultural commodities is horticulture, namely chili. In the development of chili commodities in Indonesia, an agribusiness strategy is needed to achieve chili development targets efficiently and effectively so that both chili production and prices remain in conducive conditions [4]. The strategies carried out for chili commodities so far are increasing production and productivity, improving the quality of chili products, increasing superior chili seeds, developing chili plant protection, developing chili downstream industries, and developing chili post-harvest technology. Currently, chili is one of the leading horticultural commodities because it is spread in various parts of Indonesia, and most people consume chili so that it becomes a daily need for people to consume. However, chili is also one of the agricultural commodities that is very vulnerable, both in terms of fluctuating prices, soaring demand, as well as being vulnerable because plants tend to be susceptible to pests and diseases as well as product factors that are easily decomposed so that they require technology or special post-harvest treatment [2].

The development of chili agribusiness is very necessary so that the chili farming system does not suffer losses. Chili agribusiness development can be done by taking into account various things, such as starting from the production facilities subsystem, cultivation facilities subsystem, processing and marketing subsystem, and management subsystem. The development of chili agribusiness must be done so that farmers do not experience losses and prices are stable so that consumers get products of good quality. In realizing good agribusiness development, an analytical method is needed that can be a guide and reference in developing chili. In this discussion.

### 1.2. Formulation of the problem

The formulation of the problem in this discussion is to analyze the chili agribusiness strategy using SWOT analysis in order to strengthen chili farming.

### 1.3. Objectives and benefits

The purpose and benefit of this research are to provide input to farmers or the local government on chili farming development strategies.

## 2. LITERATURE REVIEW AND DATA ANALYSIS METHODS

### 2.1. Literature of Chili

Chili is a horticultural commodity that is one of the important commodities in Indonesia. Chili has a high economic value as a horticultural product. Chili price fluctuations often cause inflation and affect the prices of other commodities. This value will change along with climate change, which will result in unstable production [6].

Chili is one of the agricultural commodities that are susceptible to spoilage both during pre-harvest and post-harvest. In the post-harvest period, several problems that are often faced are as follows: 1) influenced by production results and market absorption, causing price imbalances; 2) marketing with a long distribution pattern so that chilies have different prices in each region; 3) farmers who harvest simultaneously so that there is an oversupply; and 4) chili which is susceptible to pests and diseases that cause quality degradation and losses [6].

The high and relatively sustainable demand provides a strong impetus for farmers to develop chili cultivation. Various alternative technologies that are available and relatively easy to adopt as well as a relatively short planting time, become a separate stimulus for farmers. On the other hand, the intensive increase in chili production often causes the price of chili to fall in the market. Farmers had to accept price reductions to a very uneconomical level, and they had no choice but to sell quickly at low prices before suffering greater losses due to the perishable characteristics of chilies. Efforts to overcome this are to carry out further processing of chili in order to extend the shelf life [9].

Currently, the need for red chili in fresh form is increasing day by day with its use as a cooking ingredient, thus demanding more production, both quantitatively and qualitatively. The costs incurred will later affect the level of production, which will have an impact on farmers' income, and changes in costs and prices every year are uncertain [7].

### 2.2. Research Methods

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### 2.2.1. Place and Research Place Time

The implementation of this research is in the districts of Banyuasin, Muara Enim, and Musi Rawas. This research will be carried out for two months, namely September to October 2021. Population and Sample The objects studied are chili farmers in the three sub-districts. The population was determined by using a purposive sampling technique. The total population in each farmer group in the three sub-districts was ten people and 12 chili consumers.

### 2.2.2. Data analysis technique

The techniques used to analyze the data are as follows: First, descriptive analysis is a method used to obtain in-depth data, meaning that there is already data that contains meaning or data that is simple and definite. This descriptive analysis is used as a support to add and sharpen the analysis carried out, to help understand the problem under study, and to provide an overview of a phenomenon that occurs. Second SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) is used to evaluate opportunities and challenges in the Agribusiness environment. As for making it easier to do a SWOT analysis, a SWOT matrix is needed. The SWOT matrix will make it easier to formulate various strategies that need or must be implemented [1].

SWOT analysis is a tool to formulate decision-making and determine strategies that are taken based on logic to maximize strengths and opportunities but at the same time minimize weaknesses and threats [2]. SWOT analysis by matching the key factors that most influence both internal and external factors, will produce four sets of possible strategies, namely as follows: 1) SO (Strength-Opportunities) strategy or strengths and opportunities, is a strategy formulated by optimizing the strengths possessed to take advantage of existing opportunities; 2) WO (Weaknesses-Opportunities) strategy, or weaknesses-opportunities, is a strategy that is formulated as optimally as possible to minimize weaknesses in order to take advantage of existing opportunities; 3) ST strategy (Strength-Threats) or threat-strength, is a strategy used by utilizing the strengths possessed while anticipating threats that may be faced; 4) WT (Weaknesses-Threats) strategies or weaknesses,

## 3. DISCUSSIONS

### 3.1. Matrix Weight

Finding the weights in the test is done with an 8 X 8 matrix as shown in the following table;

**Table 1.** Weight of Internal Factors

Internal factors	Head of Food Crops and Horticulture	Gapoktan Chairman's Weight	Agricultural Extension Coordinator Weight	Gapoktan Leader Rank	Agricultural Extension Coordinator Rank	Average Rating of Cooperative Members	Cooperative Member Rank	Average Weight (B)	Average rating	Total Value (R)	Total Score Expert Rank	Eigenvalue	Score (BsR)
1	0.085	0.089	0.116	3	3	3	3.71	0.097	3.2	4	9	0.870	0.31
2	0.137	0.161	0.152	4	3	3	3.64	0.150	3.4	4	10	1.500	0.51
3	0.154	0.125	0.152	3	3	3	3.62	0.144	3.2	4	9	1.293	0.45
4	0.137	0.125	0.125	3	3	3	3.83	0.129	3.2	4	9	1.161	0.41
5	0.154	0.161	0.161	3	3	3	3.33	0.159	3.1	4	9	1.428	0.49
6	0.111	0.107	0.125	2	3	3	2.95	0.114	2.7	3	8	0.915	0.31
7	0.085	0.116	0.071	3	3	3	2.62	0.091	2.9	3	9	0.816	0.26
8	0.137	0.116	0.098	2	3	3	1.88	0.117	2.5	3	8	0.936	0.29
<b>Total</b>											<b>71</b>	<b>8.919</b>	<b>3.04</b>

Data Consistency (CI =0.13, RI=1.41, Cr=0.093) Based on the consistency Test in Table 2. the results obtained from the consistency ratio value of 0.093 where 0.093

<0.1, which means the data obtained is consistent and acceptable.

**Table 2.** Weight of External Factors

External factors	Head of Food Crops and Horticulture	Gapoktan Chairman's Weight	Agricultural Extension Coordinator Weight	Gapoktan Leader Rank	Agricultural Extension Coordinator Rank	Average Rating of Cooperative Members	Cooperative Member Rank	Average Weight (B)	Average rating	Total Value (R)	Total Score Expert Rank	Eigenvalue	Score (BsR)
1	0.170	0.152	0.161	4	4	3	3.29	0.161	3.6	11	1.77	1,771	0.58
2	0.089	0.107	0.107	3	4	4	3.12	0.101	3.5	11	1.11	1.111	0.36
3	0.125	0.107	0.125	2	3	2	2.74	0.119	2.4	7	0.83	0.833	0.29

4	0.179	0.17	0.17	4	3	3	3.60	0.173	3.4	10	1.73	1,730	0.59
5	0.089	0.089	0.08	2	3	2	2.43	0.086	2.4	7	0.60	0.602	0.20
6	0.107	0.107	0.116	2	3	2	2.26	0.110	2.3	7	0.77	0.770	0.25
7	0.116	0.107	0.107	1	2	2	1.88	0.110	1.7	5	0.55	0.550	0.19
8	0.125	0.161	0.134	4	4	3	2.98	0.140	3.5	11	1.54	1,540	0.49
<b>Total</b>											<b>8.90</b>	<b>8.97</b>	<b>2,945</b>

**3.2. SWOT Analysis Strengths of Chili Weaknesses Opportunities Threats**

strategies to maximize strengths and opportunities but can minimize weaknesses and threats on an ongoing basis.

**3.2.1. Internal factors**

The internal factors of chili price stability are policy support from the government, short production life, scattered land area, a large number of human resources of farmers who cultivate chili, long chili marketing, use of superior seeds, chili post-harvest care technology, harvest time. Simultaneously.

Internal plant factors that affect plant growth include: enzymes and hormones found in chili plants, enzymes here are used as biocatalysts that can help the metabolic process of chili plants consisting of catabolism and anabolism processes. This catabolism process will produce energy through the breakdown of 6 glucose atoms into two pyruvic acid and ATP, while the anabolism (photosynthesis) process functions to produce food.

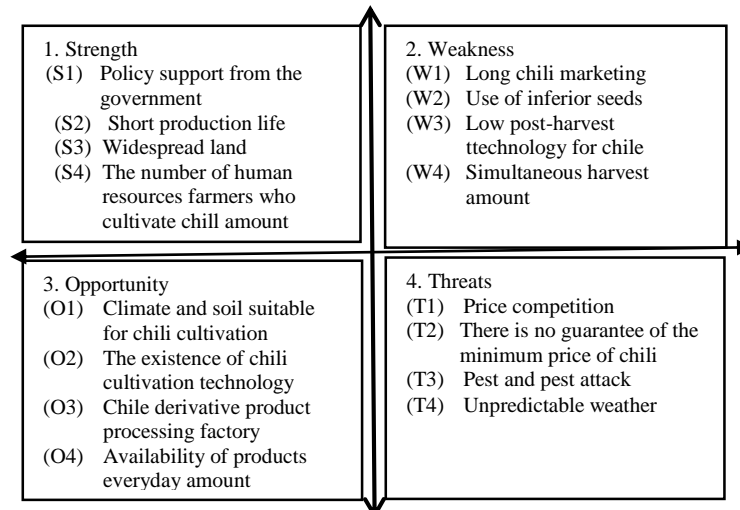
While the growth of chili plants internally will be influenced by hormones, this hormone is a chemical substance that acts as a determinant of plant growth and

development. Hormones such as auxin, gibberellins, cytokinins, ethylene, abscisic, etc., are examples of hormones found in chili plants. Each hormone has its own function that will synergize in the growth and development of chili plants.

**3.2.2. External factors**

Some of the external factors are as follows: high demand, climate, and soil suitable for chili cultivation, technology that helps chili cultivation, processing chilies into derivative products, products available every day, price competition, no guarantee of minimum chili prices, unpredictable bad weather, susceptible to attack by Plant Disease Organisms (OPT).

External factors are factors outside the plant itself that affect plant growth, such as humidity, temperature, sunlight, groundwater, soil pH, and so on, which will affect soil fertility. All of these factors must, of course, be suitable for the growth of chili plants. Therefore it is important for you to know the level of soil fertility. You can test soil fertility using soil pH meter 4 in 1, which will measure the parameters of the level of soil fertility. The table based on the analysis of internal and external factors is as follows:



**Figure 1** Analysis of internal and extrternak factors

Based on the table above, several factors that affect each aspect of the SWOT analysis are obtained from the results of the questionnaires filled out by each respondent. Furthermore, based on the results of this

SWOT analysis, an analysis will be carried out using the AHP method.

**3.3. Internal Factor Analysis Internal Factor Evaluation (IFE)**

IFE matrix is used to determine the internal factors of the business. Internal factors consist of the strengths and weaknesses of the chili business. The company's internal data and information were obtained from the identification of internal factors through interviews, observations, and direct discussions with business

owners. Discussion activities are carried out to obtain approval from business owners. The agreement is to ensure the linkage of these factors and ensure their direct impact on the chili business. The analysis is continued by giving weights and ratings by owners, employees, experts, etc. Calculation of internal factor weights using the pairwise comparison method. The results of the agricultural IFE matrix analysis are as follows.

**Table 4.** Analysis results IFE Matrix on Chili Farm

No.	Strategic Factor	Heavy (B)	Rating (R)	Total score (B X R)
A.	Strengths			
	Policy support from the government	0.10	3.2	0.31
	Short production life	0.15	3.4	0.51
	Widespread of land	0.14	3.2	0.45
	The number of human resources of farmers who cultivate chili	0.13	3.2	0.41
	Amount			<b>1.70</b>
B.	Weakness			
	Long chili marketing	0.15	3.08	0.49
	Use of inferior seeds	0.11	2.74	0.31
	Low chili post-harvest technology	0.09	2.90	0.26
	Simultaneous harvest time	0.11	2.47	0.29
	Amount			<b>1.40</b>
	Quantity (S+W)	1.00	29.40	
	difference = Score Strengths - Weaknesses = 1.7-1.4 = 0.30			

Table 4. This shows that the strength factor (Strength) has a total score of 1 and the weakness factor (Weakness) is 1.4, where the strength factor is higher than the weakness factor.

No.	Strategic Factor	Heavy (B)	Rating (R)	Total score (BXR)
A.	Opportunities			
	Climate and soil suitable for chili cultivation	0.161	3.92	0.58
	The existence of chili cultivation technology	0.101	3.70	0.36
	Chili derivative product processing factory	0.119	3.96	0.29
	Availability of products every day	0.173	1.62	0.59
	Amount			<b>1.81</b>
B.	Threat			
	price competition	0.09	2.36	0.20
	There is no guarantee of minimum chili price	0.11	2.32	0.25
	Pests and pest attacks	0.11	1.72	0.19
	Unexpected weather	0.14	3.49	0.49
	Amount			<b>1.14</b>
	Quantity (S+W)	1.00	28.00	
	difference = Score Opportunities - Threats = 1.81-1.14 = 0.67			

**Table 5.** Analysis results EFE Matrix on Chili Farm

**3.4. External Factor Evaluation (External Factor Evaluation)**

Analysis in Table 5, external factors show that for the opportunity factor (Opportunities), the total score is 1.81 while for the threat (Threats) is 1.14, it is known that the difference between the opportunity value and the threat

value is 0.13 and the strength (Strength) and Weakness (Weakness) the difference is 0.67.

Based on the results of calculations carried out in Tables 4 and 5, it can be seen that the difference between the two internal factors is 0.30, and the

difference between external factors is 0.67 with the value of the y-coordinate point. The value of this y-coordinate point shows a positive result. The result of the calculation of the coordinates (x; y) is (0.30; 0.67). The x point is on the positive axis, and the point is also on the positive axis.

The coordinates of the x and y points can be depicted in a SWOT diagram to determine the position of the chili farming development quadrant. The results of the analysis in the form of a SWOT analysis diagram can be seen in Figure 2.

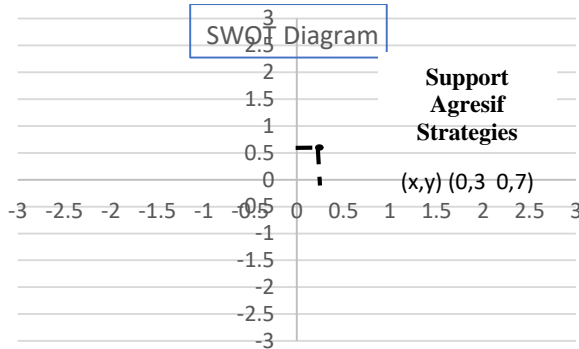


Figure 2 SWOT Diagram of Chili Farming Strategy

### 3.5. SWOT Matrix Analysis Results

Based on the SWOT analysis chart, several alternatives SO, WO, ST, and WT strategies can be produced in the development of chili farming, including the following;

Table 6. Results of SWOT Matrix Analysis

IFAS / EFAS	Strength (S)	Weakness (W)
Opportunity (O)	<p>Strategy (SO)</p> <ol style="list-style-type: none"> <li>Utilization of suitable climate and soil for chili cultivation can increase chili production supported by supportive government regulations</li> <li>By utilizing advanced technology will shorten land processing, maintenance, and harvesting of chili. Post-harvest technology will increase the shelf life of chili. With a short chili life, it will be even shorter with advanced technology</li> <li>Chili is harvested a lot because the land area is also large. The harvest can be processed into derivative products so that it can increase the selling value and shelf life. Farmers should cooperate with companies processing chili into derivative products to stabilize selling prices.</li> <li>The need for agricultural products will not change according to its development, prices must also be adjusted to market conditions, and chili is one of the necessities that is always needed to add flavor to food and is rich in vitamins. Farmers must be able to utilize the land area to produce chili with high production.</li> </ol>	<p>Strategy (WO)</p> <ol style="list-style-type: none"> <li>Farmers can cooperate with companies that manage primary chili products into processed products that have added value. So that it can shorten the marketing chain, which makes chili farming only get a small profit.</li> <li>Special guidance in terms of counseling and providing good harvesting technology by buying in installments by farmers to buy sophisticated equipment to increase chili production and save costs. Provision of superior seeds by utilizing genetic engineering technology. Superior seeds will also save costs and increase crop yields.</li> <li>The low post-harvest technology of chili can be improved by utilizing technology to meet chili demand.</li> <li>By utilizing a good climate and weather, it can minimize disease attacks on plants and will also meet market demand for chili.</li> </ol>
Threat (T)	<p>ST strategy</p> <ol style="list-style-type: none"> <li>Trying to take advantage of government support, for example, asking the government for chili prices with a minimum selling price. Ask the government to make efforts to help the chili processing process so that prices can be stable.</li> </ol>	<p>WT Strategy</p> <ol style="list-style-type: none"> <li>The old chili marketing can lead to competitive price competition.</li> <li>With the threat of pest attack, production results can deteriorate if using seeds that are not superior. Therefore, superior and pest-resistant seeds are needed and provide organic fertilizer in case of a pest attack.</li> </ol>

	<p>2. Chili has a short growing period. Take good care of chili plants by looking at chili diseases and preventing them from spreading to other chili plants.</p> <p>3. Widespread land area can minimize the disruption of Plant Pest Organisms (OPT) if planted with the correct spacing calculation, and taking good care of plants can increase production.</p> <p>4. Price competition can be overcome by strengthening the quality of chili sold. The number of farmers who grow chilies that are members of farmer groups can overcome price competition.</p>	<p>3. Uncertain weather becomes an obstacle for farmers because, with bad climatic conditions, disease attacks on plants are increasing. Therefore, farmers need to estimate natural factors in production—low chili post-harvest technology.</p>
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**4. CONCLUSION**

**4.1. Conclusion**

Based on the results of research on the Chili Development Strategy, it can be concluded that the results of the analysis on the SWOT matrix obtained coordinates of 0.30: 0.67 in quadrant one, which supports an aggressive strategy. That of all, the strength of policy support from the government has a weighted value of 0.10, and an average of 42 respondents has a value of 3.2. Short production age with a weight of 0.15 with a rating of 3.4, a widespread land area with a weight of 0.14 and a rating of 3.2, the number of human resources of farmers who cultivate chilies supports a weight of 0.12 and a rating of 3.2, so from all indicators of strength, there is chili development that has the strength to be developed. The need for horticultural commodities is always there, and there are factories that provide processed chili so that an alternative SO strategy is found as follows: Utilization of suitable climate and soil for chili cultivation can increase chili production, which is supported by supportive government regulations, by utilizing advanced technology will shorten land processing, maintenance, and harvesting of chili. Post-harvest technology will increase the shelf life of chili. With a short chili life, it will be shortened even more with sophisticated technology; many chilies are harvested because the land area is also large, the harvest can be processed into derivative products so that it can increase the selling value and shelf life and the need for agricultural products will not change according to its development, Post-harvest technology will increase the shelf life of chili. With a short chili life, it will be shortened even more with sophisticated technology; many chilies are harvested because the land area is also large, the harvest can be processed into derivative products so that it can increase the selling value and shelf life and the need for agricultural products will not change according to its development, Post-harvest technology will increase the shelf life of chili. With a short chili life, it will be shortened even more with sophisticated technology; many chilies are harvested because the land area is also large, the harvest can be processed into derivative products so that it can increase the selling

value and shelf life and the need for agricultural products will not change according to its development.

**4.2. Suggestion**

To support the Chili Development Strategy, the researchers suggest good cooperation between farmers and the agriculture office to provide direction and socialization as well as counseling to farmers in farming so that farmers are more insightful and have skills in agriculture such as skills in preventing disease attacks on plants, good land use by farmers in cultivating chili plants so that production will increase so that chili marketing will expand in other areas, and farmers can cooperate with chili processing factories to stabilize prices.

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