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# Strategies to Increase Farmers' Food Security Through the Development of Purple Sweet Potato Stick Production in North Mollo District, South Central Timor Regency (Case Study: UP2K Group of Farming Women Like to Advance Ajaobaki Village)

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A B S T R A C T
Food security remains a global challenge, especially in agricultural countries such as Indonesia. Although Indonesia has abundant natural resources, it still faces problems in ensuring sustainable food availability, access, and utilization for all communities. Food diversification is an important effort to improve food security. The UP2K Women Farmers Group of Ajaobaki Village has developed purple sweet potato sticks since 2016. However, the group faces problems such as changes in raw material prices and limited market access, causing uncertain farmer income and difficulty improving welfare. Therefore, a creative strategy is needed to combine agricultural-based industry growth with increased food production. This study provides information on sustainable purple sweet potato stick farming management. Data analysis used qualitative descriptive analysis, income analysis, and SWOT analysis. The results showed production costs of IDR 2,038,500, production of 250 pcs, selling price of IDR 10,000, and profit of IDR 461,500

## INTRODUCTION

Food security is one of the world's challenges that continues to be a concern, especially in an agrarian country like Indonesia. As a country with tremendous natural resource potential, Indonesia faces challenges in ensuring the availability, access, and sustainable use of food for all people. Food diversification, or the use of various local food sources to reduce dependence on imported food, is an important effort to improve food security.

However, smallholders are among the most vulnerable groups to food security challenges. They often face a number of problems, including changes in crop prices, limited market access, and limited capacity to convert agricultural products into value-added goods. As a result, farmers' incomes are erratic and it is difficult to improve their welfare. To overcome this, a creative strategy is needed that can combine the growth of agriculture-based industries with increased food production..

The agricultural sector, especially food crops, is found in Indonesia, including grain plants, and tubers. One of the root crops that is widely developed in Indonesia is the sweet potato commodity. The sweet potato commodity plays a fairly important role because it has many benefits and added value, both as a potential producer of carbohydrates (as a source of energy) and can be used as an alternative food source (other than rice), feed ingredients and industrial materials, or can be obtained by processing fresh sweet potatoes into flour, jam, chips, noodles, sticks and sauces. The role of sweet potato farming has good prospects as a leading agricultural commodity for palawija crops. The potential for sweet potato production can reach ± 25-40 tons per hectare and currently sweet potatoes are the most productive plant. Hasnah (2016) that the post-harvest handling of purple sweet potatoes is the processing of purple sweet potatoes and then purple sweet potato sticks and this process is referred to as the post-harvest yield processing process.

One of the agricultural businesses that has good development prospects in maintaining food security and has been developed in NTT Province is agricultural businesses from the horticulture sub-sector. This sub-sector also consists of several commodities that have the opportunity to be developed in this province, namely the purple sweet potato stick commodity. Purple sweet potato is a type of tuber that has a purple color that functions as an antioxidant. The anthocyanins in purple sweet potatoes also have a physiological function as anti-cancer, anti-bacterial protection against liver damage, heart disease and stroke. NTT Province is dominated by dry (semi-arid) land with very low organic dry matter content, neutral acidity, thin to medium soil solum, clay except in coastal areas, soil chemical fertility is relatively high, but due to lack of water, the fertility level is low and the soil types are generally Mediterranean, Red and Yellow Podsolics, Grumusol, Andosol, Reguosol and complex soils (Department of Agriculture, Food Crops and Horticulture 2004).

Ajaobaki Village is one of the villages located in North Mollo District, TTS Regency at an altitude of 1,001-1500 m above sea level. Geographically, this village has an area of 1800 Ha, (Bukifan, et al 2021). And currently it is the gateway to Fatumnasi and Fatukoto tourism places with a percentage of 95% of the people working as farmers. One of the groups that has become the center of attention of the people of Ajaobaki Village from tourist visitors, both from within the region and from outside the region, is the UP2K Group (Efforts to Improve Group Opinion) Farmers Suka Maju Ajaobaki Village. The potential it has is the processing of purple sweet potato sticks. Purple sweet potato sticks are one of the products produced by the UP2K (Group Income Improvement Effort) group of Suka Maju Farming Women in Ajaobaki Village. From the UP2K Gaya Maju Aja Maju Farmers Women's Group, there are 15 members.

Purple sweet potato sticks are a business owned by the UP2K group of progressive farmer women in Ajaobaki Village, North Mollo District, TTS Regency. This farmer group was established in 2011 with the number of farmer group members approximately 30 people. This farmer group was built with the aim of increasing family income based on desires driven by opportunity and still continues to this day. However, over time the members of the farmer group were reduced to 15 people due to death, and migrated. In 2018 the UP2K Suka Maju Farmers Women's Group of Ajaobaki Village produced current products of Rp.1,000,000-1,500.00 per day. And the production of the UP2K Farmers group has experienced a very drastic decrease in production due to the implementation of restrictions on community activities (PPKM). The farmer group produced in 2019, 2020 and 2021 of Rp. 300,000 per day. In addition, the business developed has not been running optimally, both in terms of income, the type of activity that is running fluctuates. This research can be a solution to get information on how to manage farming in various regions that have different ethnicities, and be a consideration for the government in setting policies for rice farmers to be more specific to location. Risk preferences in several studies are a reference in determining agricultural development strategies (Asravor, 2018; Waduge et al., 2015; Fahad et al., 2018).

## THEORETICAL REVIEW

### *Food Security and Local Food Diversification*

Food security is closely related to the ability of a community to ensure the availability, accessibility, and utilization of food in a sustainable manner. In agricultural regions, food security does not only depend on the quantity of food production, but also on the ability of farmers to manage local food resources into products that have economic value. Food diversification is one of the important strategies to reduce dependence on one type of staple food and to strengthen local food systems. Through diversification, local commodities can be processed into alternative food products that support household consumption and increase farmer income.

Purple sweet potato is one of the local food commodities that has potential to support food diversification. This commodity can be used as an alternative carbohydrate source and processed into various food products, such as flour, jam, chips, noodles, sauce, and sticks. Hasnah (2016) explains that post-harvest handling of purple sweet potato can be carried out through processing activities, including the production of purple sweet potato sticks. This shows that purple sweet potato has added value when it is not only sold as a fresh agricultural product, but also processed into food products with higher market value.

***Purple Sweet Potato as a Local Food Commodity***

Purple sweet potato has an important role as a local food commodity because it contains carbohydrates and has potential as an alternative food source. In addition, purple sweet potato has nutritional benefits because it contains anthocyanins. Anthocyanins in purple sweet potato function as antioxidants and have physiological benefits, including protection against several health risks. Therefore, the development of purple sweet potato-based products can support both food diversification and the improvement of community nutrition.

The potential of purple sweet potato is also supported by the agroecological conditions of several regions in Indonesia, including East Nusa Tenggara. The Department of Agriculture, Food Crops and Horticulture (2004) explains that East Nusa Tenggara is dominated by dry land with specific soil characteristics. Although this region faces water limitations, several agricultural commodities can still be developed according to local conditions. This situation makes the development of purple sweet potato important because it can become a local commodity that supports food security and farmer income.

***Women Farmer Groups and Agroindustry Development***

The development of agricultural-based products is strongly related to the role of farmer groups. Farmer groups can become a medium for increasing production capacity, strengthening cooperation, and expanding marketing access. In Ajaobaki Village, the UP2K Suka Maju Women Farmer Group has developed purple sweet potato sticks as a processed food product. Bukifan et al. (2021) explain that Ajaobaki Village is located at an altitude of 1,001 to 1,500 meters above sea level and has potential because it is located near tourism areas. This condition provides an opportunity for local food products to be marketed to both local consumers and tourists.

The role of women farmer groups is important because they contribute to household income and rural economic development. The processing of purple sweet potato into sticks provides added value to local agricultural products. However, the development of this business still faces several challenges, such as limited labor, weak capital, limited market information, and product durability. Therefore, the development of agroindustry at the farmer group level requires proper management from production to marketing.

***Income Analysis in Purple Sweet Potato Stick Business***

Income analysis is used to determine the economic benefit obtained from a business activity. In agricultural business, income is generally calculated from the difference between total revenue and total production cost. Falo et al. (2016) state that farmer income can increase when farming development is carried out by considering strategies from the cultivation process to the marketing process. This means that income improvement is not only influenced by production volume, but also by business management, marketing strategy, and product development.

In the purple sweet potato stick business, production costs include fixed costs and variable costs. Fixed costs are related to production equipment, while variable costs are related to raw materials and other supporting materials used in one production process. Revenue is obtained from the multiplication of product quantity and selling price. The income formula used in this study is P = TR - TC, where P refers to income, TR refers to total revenue, and TC refers to total cost. This calculation helps determine whether the purple sweet potato stick business can provide profit for the UP2K Suka Maju Women Farmer Group.

***SWOT Analysis in Business Development Strategy***

SWOT analysis is used to identify internal and external factors that influence business development. Internal factors include strengths and weaknesses, while external factors include opportunities and threats. Rangkuti (2003) explains that SWOT analysis can be used to compare internal and external strategic factors in order to formulate appropriate development strategies. This approach is relevant for small-scale agricultural businesses because it helps identify the position of the business and the strategy that should be applied.

In the context of purple sweet potato stick production, strengths include farmer experience, good product quality, ownership of production equipment, and consumer trust. Weaknesses include limited education, limited labor, weak capital, and limited market information. Opportunities include the availability of raw materials, suitable climate, and the existence of tourism areas. Threats include product imitation, raw material damage, and declining production due to external disruptions. These factors need to be analyzed systematically to determine the most suitable development strategy.

Rangkuti (2006) states that the SWOT matrix can be used to formulate alternative strategies by combining strengths, weaknesses, opportunities, and threats. The S-O strategy uses strengths to take advantage of opportunities. The W-O strategy uses opportunities to overcome weaknesses. The S-T strategy uses strengths to avoid threats. The W-T strategy minimizes weaknesses and avoids threats. In this study, the SWOT approach is suitable because the purple sweet potato stick business has internal strengths and external opportunities that can support business growth.

Based on the literature, the development of purple sweet potato stick production is connected to food security, food diversification, income improvement, and business development strategy. Purple sweet potato as a local commodity supports food diversification. The processing of purple sweet potato into sticks increases product value and creates income opportunities for farmer groups. Income analysis is used to measure business profitability, while SWOT analysis is used to formulate development strategies based on internal and external conditions.

Therefore, this study is grounded on the idea that local food processing can strengthen farmer food security when supported by proper income management and strategic business development. The UP2K Suka Maju Women Farmer Group has potential to develop purple sweet potato stick production because it has product quality, farmer experience, available raw materials, and market opportunities from surrounding regions and tourism areas. However, this potential needs to be supported by training, capital strengthening, production improvement, and wider marketing networks.

**METHODOLOGY**

This research was conducted in the UP2K Group of Women Farmers in Ajaobaki Village, North Mollo District, TTS Regency, NTT Province**.** The consideration is because the UP2K Group of Farmers Women Like to Advance Ajaobaki Village as a producer of purple sweet potato sticks. The data used is primary data which is data obtained from the first source/directly obtained at the research site, both orally and in writing from the respondents. The data includes observation data, interviews and data from filling out questionnaires. As well as secondary data, namely data obtained from relevant literature, books, journals, the internet, and other related agencies.

***Analysis Method to determine the Purple Sweet Potato Stick Business Model***

Descriptive analysis is a research method by collecting data according to the actual situation and then compiling, processing and analyzing the data to be able to provide an overview of the problem at hand. In descriptive analysis, data is usually displayed in the form of regular tables or frequency tables, graphs, bar charts, line charts, pie charts, data centering size, data dispersion size and so on (Sugiyono, 2010).

***Method of Analysis of Purple Sweet Potato Sticks Business Income***

The calculation of income obtained is carried out using the income formula:

$$P = TR - TC$$

Where:

P = Purple sweet potato steak business income
TR = Total revenue from purple sweet potato sticks
TC = Total Cost of Purple Sweet Potato Sticks

***Method of Analysis of Purple Sweet Potato Business Development Strategy***

SWOT analysis is an analysis of internal business factors in the form of strengths, weaknesses, and external factors in the form of opportunities and threats to determine the development strategy of the purple sweet potato stick business in the UP2K group of Suka Maju Farmers Women, Ajaobaki Village, North Mollo District, South Central Timor Regency. The analysis was made according to the instructions of Rangkuti (2003) with the following matrix model:

Table 1. Analysis Model of Purple Sweet Potato Business Development Strategy

| (IFAS) / (EFAS) | **Strength (S)**<br>❖ **Factor 1**<br>❖ **Factor 2** | **Disadvantages (W)**<br>❖ **Factor 1**<br>❖ **Factor 2** |
|---|---|---|
| **Odds (O)**<br>❖ **Factor 1**<br>❖ **Factor 2** | **Strategi SO (I)**<br>Strategies to use power to take advantage of opportunities | **Strategi WO (III)**<br>Strategies that capitalize on opportunities to overcome weaknesses |
| **Threat (T)**<br>❖ **Factor 1**<br>❖ **Factor 2** | **Strategi ST (II)**<br>Strategies of using force to avoid threats | **WT Strategy (IV)**<br>Strategies of using force to avoid threats |

1. S-O Strategy

This strategy is made based on a very conducive farming situation by utilizing all the strength to seize and take advantage of the greatest opportunities that are growth-oriented (*grouwd oriented strategy*) or support aggressive policies. Aggressive growth can be achieved through market penetration, market development, and product development.

2. S-T Strategy

This strategy is a strategy where the company uses certain strengths that the company has to deal with an unfavorable environment or threat. The strength they have will make the most of it to take advantage of long-term opportunities.

3. Stratego W-O

This strategy is applied based on the utilization of existing opportunities by minimizing existing weaknesses because the company experiences very large market opportunities, but on the other hand experiences internal weakness constraints.

4. W-T Strategy

This strategy is based on *defensive* activities and seeks to minimize existing weaknesses and avoid threats because the company faces a very unfavorable situation.

SWOT analysis is used to compare internal factors and external factors. Internal factors are made up of strengths and weaknesses, and external factors are made up of opportunities and threats. Rangkuti (2003).

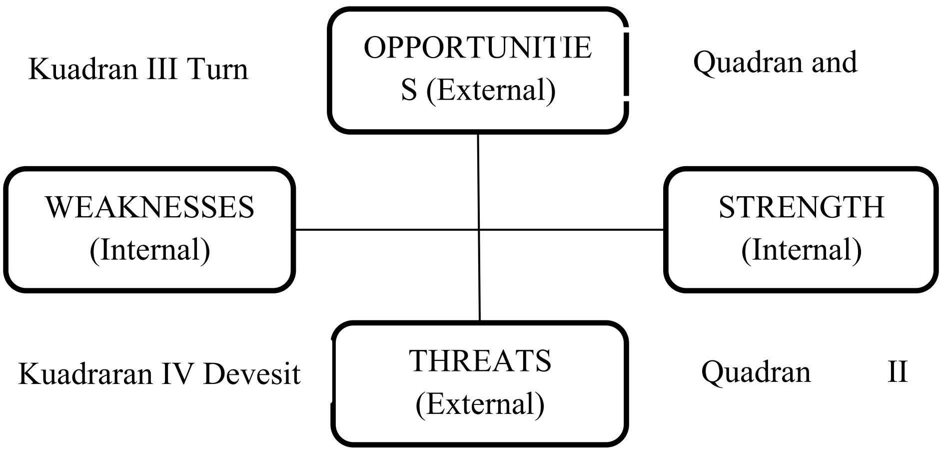


Figure 1. SWOT Analysis Chart

Description:

1. Quadrant I Is a favorable situation: Certain businesses that have opportunities and strengths so that they can take advantage of existing opportunities. The strategy implemented under existing conditions supports aggressive growth policies.
2. Quadrant II despite facing threats: Despite the various threats, the company still has internal strength. The strategy applied is to use power to take advantage of long-term opportunities.

3. Quadrant III faces the odds: The company faces enormous market opportunities, but on the other hand faces internal weaknesses. The focus of this strategy is to minimize internal problems so that it can seize the market better.
4. Quadrant IV faces weaknesses: This is a situation that is very unfavorable to the company due to various internal threats and weaknesses. This strategy performs rescue measures to escape greater losses.

In the SWOT analysis, a comparison is made between internal and external strategy factors to obtain a strategy for each of these factors.

**RESEARCH RESULTS AND DISCUSSION**

***Analysis of Purple Sweet Potato Stick Business Income in UP2K Group Farmer Women like to progress in Ajaobaki Village***

***Production Costs***

Production costs are a sacrifice that is assessed by money in the purple sweet potato stick business. In this study, not all costs were declared as costs. The victim who is taken into account as a cost is the victim in the form of cash by the producer during the production of purple sweet potato sticks. There are two business costs, namely:

***Fixed Cost***

Fixed costs are one of the costs incurred during the production process which is not affected by the amount of production produced and expressed in rupiah units. The fixed cost in this research is all the equipment for the production of purple sweet potato sticks. Based on the calculation of fixed costs, it can be seen that the total average fixed cost in the purple sweet potato stick production business is as much = Rp.2,480,000, with a total depreciation cost of Rp. 1,182,500.

***Variable Cost***

Variable cost is a sacrificial cost that must be incurred continuously by the producer for one production and other supporting materials for the running of the production process. Based on the results of the research released from the UP2K group of Suka Maju Farmers in Ajaobaki Village, it can be seen that the total variable costs incurred in one production in trying purple sweet potato sticks are as follows, the cost of materials is Rp.856,000.

So the total cost incurred by the UP2K Suka Maju Farmers Group in Ajaobaki Village is Rp.856,000 + Rp.1,182,500 = Rp.2,038,500

***Purple Sweet Potato Sticks Business Receipts***

Revenue is the multiplication of the production of purple sweet potato sticks multiplied by the selling price of purple sweet potato sticks. The total receipt of purple sweet potato sticks obtained from the UP2K Group of Suka Maju Farmers Women in Ajaobaki Village can be calculated using the following formula:

TR = P x Q

Production cost = selling price x quantity of products

= 10,000 x 250

= IDR 2,500,000

***Purple Sweet Potato Sticks Business Income***

Farmers' income can increase if the development of commercial garlic farming is carried out by paying attention to the development strategies starting from the cultivation process to the marketing process to increase farmers' income (Falo, et al 2016). Revenue is the difference between revenue and production costs. The income of the purple sweet potato stick business obtained from the UP2K Suka Maju Farmers Group of Ajaobaki Village can be calculated using the following formula:

P = TR – TC
Revenue = Revenue – Total Cost
= 2,500,000 – 2,038,500
= Rp. 461,500

Table 2. Income of UP2K Group of Farming Women Like to Advance Ajaobaki Village

| es | Covid-19 Revenue | One-Time Production/Packaging | Production/month/bgks | Income/mo/Rp | Production/Yr/Bngks | Income/Yr/Rp |
|---|---|---|---|---|---|---|
| | Revenue (2018) | 250 | 1.000 | 10.000.000 | 12.000 | 120.000.000 |
| | Revenue (2019) | 112 | 450 | 4.500.000 | 5.400 | 54.000.000 |
| | Revenue (2021) | 150 | 600 | 6.000.000 | 7.200 | 72.000.000 |

Table 3. Assessment of Urgency and Performance Aspects in the Development of Purple Sweet Potato Stick Business

| Production Cost Per Year (Rp) | Production | Selling Price | Admission (Rp) | Income (Rp) |
|---|---|---|---|---|
| | 4,76* | 3,18** | 4,76* | 3,18** |
| Social economic culture | 4,69 | 2,88 | 4,69 | 2,88 |
| Conservation | 5,19 | 4,12 | 5,19 | 4,12 |
| Consumer | 4,56 | 2,94 | 4,56 | 2,94 |
| Administration | 5,00 | 3,47 | 5,00 | 3,47 |
| Marketing | 4,94 | 2,76 | 4,94 | 2,76 |

Based on the calculations in table 2, it can be seen that the production of purple sweet potato sticks produced by the UP2K Suka Maju Farmers Women's Group in Ajaobaki Village in 2018 was a one-time production of 250 packs with a selling price of Rp. 10,000 per pack. Meanwhile, the production of purple sweet potato sticks per month is 1,000 packs with a selling price of Rp.10,000 per pack so that it gets a monthly income of Rp.10,000,000. In 2019, the production of purple sweet potato sticks decreased due to.

Table 4. Urgency and Performance Assessment of Important Aspects in Purple Sweet Potato Stick Business Development

| Important Aspect | Urgency | Performance | Urgency | Performance |
|---|---|---|---|---|
| Attractiveness | 4,76* | 3,18** | 4,76* | 3,18** |
| Social economic culture | 4,69 | 2,88 | 4,69 | 2,88 |
| Conservation | 5,19 | 4,12 | 5,19 | 4,12 |
| Consumer | 4,56 | 2,94 | 4,56 | 2,94 |
| Administration | 5,00 | 3,47 | 5,00 | 3,47 |
| Marketing | 4,94 | 2,76 | 4,94 | 2,76 |

There is a relaxation of restrictions on community activities (PPKM) so that a total of 112 packs of one production is one. The total monthly production is 450 packs with a selling price of Rp. 10,000, so that the average monthly income is Rp. 4,500,000. Meanwhile, the production of purple sweet potato sticks per year is 5,400 packs of total production, with a selling price of Rp. 10,000 and a total annual income of Rp. 54,000,000. In 2021, activities have returned to normal so that income has increased again. The total production of purple sweet potato sticks is 150 packs. Meanwhile, the total monthly production is 600 packs with a selling price of Rp.10,000, so that the monthly income is Rp.6,000,000. while the annual production of products is 7,200 packs with a selling price of Rp.10,000, so that the total average annual income is Rp.72,000,000.

The marketing process of the production of purple sweet potato sticks carried out by the UP2K Suka Maju Farmers Women's Group in Ajaobaki Village to several customers in various regions such as Belu Regency, TTU, Soe, and Kupang City. The number of products sold to retail customers in 2018 in Belu Regency was 200 packs, TTU Regency was 200 packs, Soe City was 200 packs and Kupang City was 200 packs and the rest was marketed in the farmer group. Meanwhile, the sales process to retail customers in 2019 decreased so that sales to customers in Belu district were 100 packs, TTU district was 100 packs, Soe city was 100 packs and Kupang City was 100 packs, the rest was marketed to farmer groups. In 2021, the marketing process to retail customers increased again so that sales to customers in Belu Regency were 150 packs, TTU Regency was 150 packs, Soe City was 150 packs and Kupang City was 150 packs.

***SWOT Analysis of the Development of the Purple Sweet Potato Stick Business in the UP2K Group Farmer Women like to progress in Ajaobaki Village***

SWOT analysis is shown to: (i) identify various internal factors and external factors, (ii) to formulate a strategy for the development of the purple sweet potato stick business. This analysis is based on efforts to maximize strengths and opportunities, but can minimize opportunities and threats together.

Table 5. Internal and external factors of the Purple Sweet Potato Stick Business in Ajaobaki Village

| No | Strategic Factors | |
|---|---|---|
| | **Internal Factors** | **External Factors** |
| | **Strength (Sreanghts)** | **Peluang (Opportinuties)** |
| 1 | Experienced farmers process purple sweet potato sticks | Have a suitable climate |
| 2 | Good product quality | There are many tourist attractions |
| 3 | Have its own purple sweet potato stick production equipment | Availability of raw materials |
| 4 | Purple sweet potato stick products have been entrusted | |
| | **Weakness** | **Threats** |
| 5 | Primary education | The Covid-19 Virus Attack Affects Decreased Production |
| 6 | Lack of labor availability | The production of purple sweet potato sticks is easy to imitate |
| 7 | Weak capital | There is damage to raw materials so that they cannot be produced |
| 8 | Products that have been stored for 2 months are not sold will expire | |

***Internal Factors of Purple Sweet Potato Stick Farming***

Internal factors are one of the influential factors within a business itself. Internal factors have two indicators, namely strengths and weaknesses. According to the results of data collection from each respondent in the UP2K Wanita Tani Suka Maju Group of Ajaobaki Village in the development of the purple sweet potato stick business has strengths, weaknesses, opportunities and threats whose indicators can give values, weights, branches, and scores where: Scores are obtained from the results of rounding the average score of the questionnaire, weights are obtained from the results of the distribution of the value of strategic factors with the total score in the value column, Twigs were obtained from the results of the author's discussion with farmers on the development of purple sweet potato sticks and the score was obtained from the weight multiplied by the twigs. For more clarity, see table 6.

Table 6. Internal Matrix Factor Analysis System (IFAS) of Purple Sweet Potato Sticks.

| **Strategic Factors**<br>**Strength Factor** | **Weight** | **Rating** | **Score** |
|---|---|---|---|
| Experienced farmers in processing purple sweet potato sticks | 0,13 | 4 | 0,53 |

| | | | |
|---|---|---|---|
| Good product quality | 0,13 | 4 | 0,53 |
| The production of purple sweet potato sticks has been entrusted | 0,13 | 4 | 0,53 |
| Have its own purple sweet potato stick production equipment | 0,13 | 4 | 0,5 3 |
| Has good nutritional content | 0,1 | 3 | 0,3 |
| **Total** | **0,62** | **19** | **2,42** |
| **Factors of Weakness** | | | |
| Primary education | 0,1 | 3 | 0,3 |
| Lack of labor availability | 0,03 | 1 | 0,03 |
| Market information | 0,03 | 1 | 0,03 |
| Products stored for 2 months will expire | 0,06 | 2 | 0,03 |
| Weak capital | 0,13 | 4 | 0,53 |
| **Total** | **0,35** | **11** | **0,92** |
| **Total (S+W)** | **1** | | **3,46** |
| **Total (S-W)** | | | **1,5** |

In the table above, it can be seen that the calculation of the number of item weights can be known from the total weight rating divided by the total weight rating of Ifas. Meanwhile, in the calculation of the score, it can be known from the total weight of the item multiplied by the weight rating so that the total score is obtained.

Based on the table above, the total IFAS score for purple sweet potato stick farming in the UP2K Suka Maju Farmers Women's Group in Ajaobaki Village was 3.46 which consisted of a strength score of 2.42 with the highest strength score of 0.53, namely the leading commodity. And the total weakness score is 0.92 with the lowest weakness factor score of 0.03. Therefore, by paying attention to the existing strength and weakness factors, the purple sweet potato sticks in the UP2K Group of Suka Maju Women Farmers in Ajaobaki Village can still continue to be developed, the strength factor is more dominant than the weakness factor.

***External Factors of Purple Sweet Potato Stick Farming***

External factors are one of the factors that affect the farming environment from outside the farming environment. External factors have two parts of indicators, namely opportunities and threats, where the factors that have been identified are classified as external environmental factors that will be evaluated to find out how much of an impact they have on purple sweet potato stick farming in the UP2K Group of Suka Maju Farmers in Ajaobaki Village. Based on the results of data collection from each respondent, the environmental factors that are classified as business opportunities and threats that have been evaluated can be seen in table 7.

Table 7. External Matrix Factor Analysis System (EFAS) of Sweet Potato Stick Farming Purple Spears in Ajaobaki Village

| Strategic Factors | Weight | Rating | Shoes |
|---|---|---|---|
| **Opportunity Factor** | | | |
| Have a suitable climate | 0,19 | 4 | 0,76 |
| Availability of raw materials | 0,13 | 4 | 0,53 |
| There are many tourist attractions | 0,19 | 4 | 0,76 |
| **Total** | **0,51** | **12** | **2,05** |
| **Threat Factors** | | | |
| The Covid-19 Virus Attack Affects Decreased Production | 0,14 | 3 | 0,42 |
| Damage to raw materials | 0,14 | 3 | 0,42 |
| Purple sweet potato steak products are easy to imitate | 0,14 | 3 | 0,42 |
| **Total** | **0,42** | **9** | **1,26** |
| **Total (O+T)** | **1** | | **3,31** |
| **Total (O-T)** | | | **0,79** |

In the table above, it can be seen that the calculation of the number of item weights can be known from the total rating divided by the total weight rating of Ifas. Meanwhile, in the calculation of the score, it can be known from the total weight of the item multiplied by the weight rating so that the total score is obtained.

Based on the results of the calculation in the table above, the total EFAS score for purple sweet potato sticks farming in the UP2K Group of Suka Maju Farmers in Ajaobaki Village was 3.31 which consisted of an opportunity score of 2.05 with the highest prluang score of 0.19, namely the leading commodity and a threat score of 1.26 with the lowest threat factor score of 0.14. Therefore, by paying attention to the opportunities and threats that exist, purple sweet potato stick farming still continues to be developed, the opportunity factor is more dominant than the threat factor.

***Alternative Strategic Decision Making in SWOT Analysis***

Based on the assessment of Internal System Analysis Factors (IFAS) and External System Analysis Factors (EFAS) carried out by the farming development strategy in the UP2K Group of Suka Maju Farmers in Ajaobaki Village based on the analysis of internal factors and external factors, the amount of reduction between the number of opportunities and threats to grow (y) is carried out, then the value of x = (S-W) = 2.42-0.92 = 1.5 and the value (y) = (O-T) = 2.05-1.26 = 0.79. Therefore, the numbers were obtained from both sumbuh x and y = 1.5 and 0.79 which had positive values for the development of purple sweet potato stick farming in the UP2K group of Suka Maju Farmers in Ajaobaki Village. More details can be seen in the following graph.

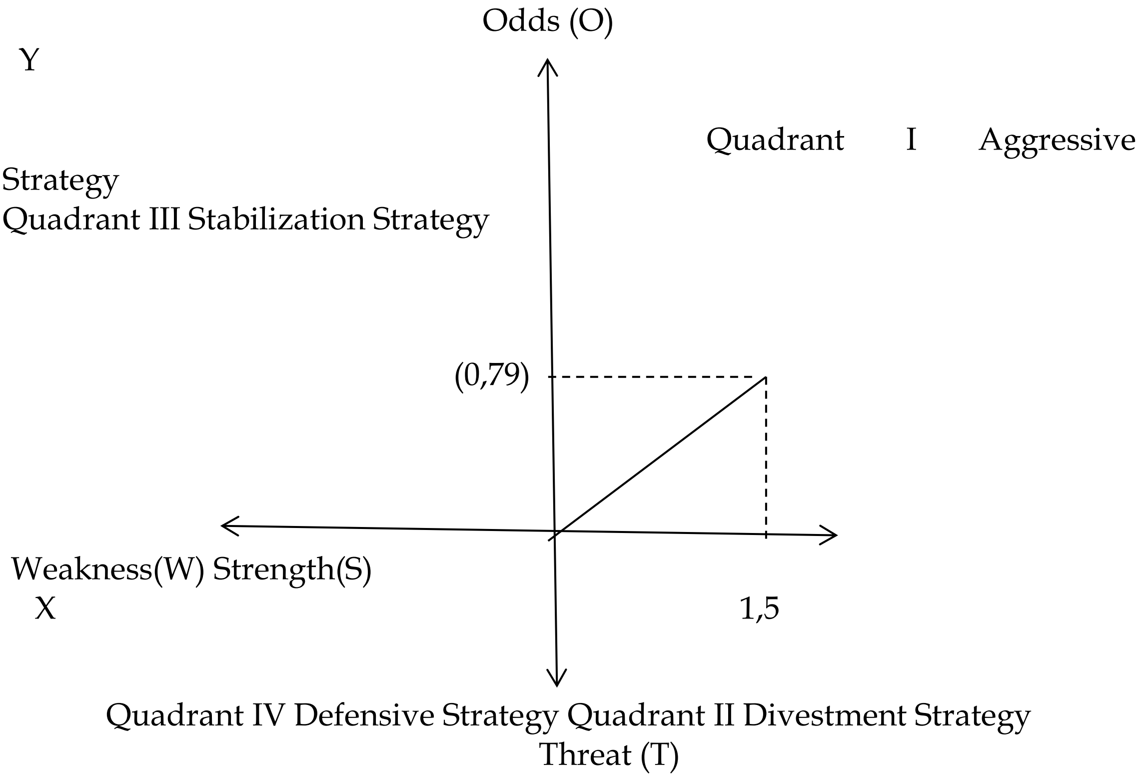


Figure 2. SWOT chart analysis

The results of data analysis in the SWOT diagram can be obtained coordinates 1.5 and 0.79 where these coordinates are in square I, which is an aggressive strategy. The strategy for the development of the purple sweet potato stick business in the UP2K Suka Maju Farmers Women's Group in Ajaobaki Village has strengths and opportunities that are united and mutually supportive, namely by using strength to take advantage of existing opportunities.

***Matriks SWOT (Strength, Weakness, Opportunuti, Threat).***

According to Rangkuti 2006, the SWOT Matrix is one of the tools used to compile factors as a strategic alternative that can clearly describe how internal strengths and weaknesses are faced so that opportunities and threats can be adjusted in the development of purple sweet potato sticks. The SWOT matrix can be seen in table 8.

Table 8. Alternative Strategies for the Development of Purple Sweet Potato Sticks

| **Internal factors** | **Strength (S)** | **Disadvantages (W)** |
|---|---|---|
| | 1) Experienced farmers in managing purple sweet potato sticks<br>2) Good product quality<br>3) The product has been entrusted because it already has a label | 1) Lack of information technology production techniques for the management of purple sweet potato sticks<br>2) Purple sweet potato steak products are easy to imitate |

| | | |
|---|---|---|
| **External factors** | 4) Have its own tools to produce purple sweet potato sticks | 3) Lack of market information<br>4) Products that are stored for 3 months are not sold out, then they must be thrown away and result in losses |
| **Odds (O)**<br>1) Availability of foodstuffs<br>2) Easy to market<br>3) High production price | **S-O Strategy**<br>1) Increasing farmers' knowledge for the development of purple sweet potato stick farming through socialization or training from the agriculture office. (S1, S2, S3,S4, O1, O2, 03)<br>2) Increase the production of purple sweet potato sticks well to meet the high market demand. (S2, S3, O2,O3)<br>3) Improving the management technique of purple sweet potato sticks from the production process to marketing. (S1, S2, S3, S4, O1, O2, O3) | **W-O Strategy**<br>1) Improving farmers' human resources in the field of education and technology in farming purple sweet potato sticks. (W1,O1,O2,O3)<br>2) Opening a network of cooperation opportunities with various other parties both in the development and marketing of the purple sweet potato stick business. (W1,W3, W4, O1,O2,03)<br>3) Guidance for farmers in managing the ingredients of purple sweet potato sticks. (W2,W4,O1,O2,O3) |
| **Threat (T)**<br>1) Purple sweet potato sticks products are easy to imitate and there will be many opportunities for others and there will be price competition | **S-T Strategy**<br>1) Anticipating the threat of competition in the price of the same product using the development of purple sweet potato stick farming. (S1,S2,S3,S4,T1) | **W-T Strategy**<br>1) Improving and evaluating farmers' knowledge in farming purple sweet potato sticks so that the generation of enthusiasts increases in the purple sweet potato |

| | | |
|---|---|---|
| **2)** There is damage to purple sweet potatoes so they are not suitable for use | | stick business. (W1,T1,T2,T3) |

After identifying internal factors and external factors that are strengths and weaknesses as well as opportunities and threats in the development of purple sweet potato stick farming in the UP2K Suka Maju Farmers Women's Group, Ajaobaki Village. The SWOT matrix analysis obtained several alternative strategies as follows:

S - O : This strategy is made by utilizing all the strength of purple sweet potato stick farming to seize and get the greatest opportunity from the external environment. Based on the results of the research, the S-O strategy was formulated, among others, to improve the ability of farmers in the development of the purple sweet potato stick business through training or socialization from the agriculture office, increase the production of the purple sweet potato stick business well to meet market demand, improve production technology and coach farmers in need of training.

W – O Strategy: This strategy is applied based on opportunities that exist in the external environment to minimize the weaknesses of farmers who farm purple sweet potato sticks. Based on the results of the research, the W-O strategy can be formulated as follows, namely in improving farmers' human resources in the field of education and technology in farming purple sweet potato sticks.opening a network of cooperation with various parties both in the development of farming and marketing, fostering farmers in managing purple sweet potato stick products.

S-T Strategy: This strategy is one of the strategies that can optimize existing internal strengths, in avoiding threats from outside. An alternative S-T strategy can be formulated as follows, namely anticipating the threat of price competition between the same products using the development of farming methods for the production of purple sweet potato sticks.

The W - T strategy: is one of the strategies that is based on activities that are defensive and try to minimize existing weaknesses and avoid threats. Based on the results of the research, the W-T strategy can be formulated as follows, namely improving farmers' human resources in the field of education and technology in farming, the production of purple sweet potato sticks opens a network of cooperation with various parties both in the development of farming and marketing, so that the development of farmers in managing purple sweet potato stick products.

## CONCLUSIONS AND RECOMMENDATIONS

The general overview of the purple sweet potato stick business is: Purple sweet potato sticks are produced by the UP2K Suka Maju Farmers Women's Group of Ajaobaki Village located in North Mollo District, South Central Timor Regency (TTS). Purple sweet potato sticks are made from purple sweet potato raw materials where purple sweet potatoes are found from their own land and are available from the market. Purple sweet potato sticks can be produced using tools such as: noodle moles, pots, pans, stoves, ero-ero and sutel. The purple sweet potato sticks are marketed in farmer group huts and several retail traders in Belu Regency, North Central Timor Regency (TTU), Soe City, and Kupang Regency.

Based on the results of the analysis of the income of purple sweet potato sticks per one production in the UP2K Suka Maju Farmer Women's Group, Ajaobaki Village, North Mollo District, South Central Timor Regency, it can be seen that the total income in the farmer group is Rp. 461,500

Based on the results of the calculation in the SWOT diagram analysis strategy, the development strategy of the purple sweet potato stick business in the UP2K Group of Suka Maju Farmers Women, Ajaobaki Village, North Mollo District, South Central Timor Regency is contained in the strategy of quadrant one (I), namely the Aggressive Strategy.

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