

Development Strategy for Seaweed Agroindustry on Household Scale in Mataram City

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Abstract

The research objectives are (1) Analyzing alternative strategies for developing agroindustry made from seaweed in Mataram City and (2) Analyzing the strategic options that are prioritized in the development of seaweed agroindustry in Mataram City. The research method uses descriptive methods. The research location was determined using the purposive sampling technique. The primary respondents in the research were seaweed agroindustry entrepreneurs. To strengthen data related to product quality and price instruments, data was added by interviewing buyers/consumers as additional respondents, so the assessment was more objective. Producer respondents were determined using the census method, while consumer respondents were determined using the Accidental Sampling method. The results of the research show (1) Alternative development strategies using SWOT, obtained by micro-businesses in quadrant III (WO Strategy) include utilizing coaching for access to capital, modern technology, good packaging, expanding the market through social media, increasing the number of human resources, and promotions to overcome less strategic location. For small businesses in quadrant I (SO Strategy) by utilizing experience and business permits to create employment opportunities, process agricultural products, promote quality products without preservatives, and use guidance from related agencies, (2) QSPM matrix analysis produces priority strategies for Micro business is expanding the market and promoting through social media to meet high product demand, while for small business it is increasing the added value of products with available raw materials and utilizing guidance from related agencies.

Keywords: Agroindustry, Seaweed, SWOT, QSPM.

Introduction

The agricultural sector plays a significant role in economic development, especially in agrarian countries like Indonesia. Economic development is primarily supported by the agricultural sector and the processing of agricultural materials, known as agroindustry. In the agroeconomic system, agroindustry is integral to the agricultural sector. Apart from that, agroindustry is a component that, together with other components, builds agribusiness. Developing the agricultural product processing industry can increase production, increase the price of agricultural products, increase farmers' profits, and create added value for agricultural products (Eltri, 2020).

Seaweed is included in the microalgae of the *Thallophyta division*, namely plants whose body structure consists of a stem without a leaf or root. In Indonesia, seaweed has long been consumed, especially in coastal areas. Indonesian seaweed is in great demand because of its high content of carrageenan, agar, and alginate, making it an ideal raw material for the food, flavoring, ice cream stabilizer formation inhibitor, and pharmaceutical industries (Soetjiptoet *al.*, 2019). One of the largest seaweed-producing regions in Indonesia is West Nusa Tenggara (NTB) Province, with a production potential of 696,765.83/ton in 2022 and entering fourth place after East Nusa Tenggara, South Sulawesi and North Kalimantan. In Mataram City, several household-scale businesses process seaweed.

Based on data obtained from the NTB Province Maritime and Fisheries Service, the number of seaweed agroindustry in 2020 was 15 entrepreneurs. Then, data from the Mataram City Fisheries Service in

2023 shows that the number of seaweed agroindustry has decreased to 12 entrepreneurs. After further investigation, the number of agroindustry still actively processing seaweed in Mataram City remains at 9 entrepreneurs. This is due to the need for development strategies carried out and the existence of obstacles in a business. Therefore, it is necessary to know the seaweed development strategy so that the number of agroindustries will not decrease.

The research aims to (1) Identify the characteristics of seaweed agroindustry entrepreneurs in Mataram City; (2) Identify internal and external factors for the development of seaweed agroindustry in Mataram City; (3) Analyze alternative strategies for developing agroindustry made from seaweed in Mataram City; and (4) Analyze the strategic options that are prioritized in the development of seaweed agroindustry in Mataram City.

Research Methods

The research used a descriptive method, and location selection was carried out using Purposive Sampling techniques. The primary respondents in the research were seaweed agroindustry entrepreneurs. To strengthen data related to product quality and price instruments, data was added by interviewing buyers/consumers as additional respondents to make the assessment more objective. Producer respondents were determined using the census method, while consumer respondents were determined using the Accidental Sampling method. The types of data in research include quantitative and qualitative data, while data sources consist of primary and secondary data. The data collection technique was carried out using survey techniques.

Data analysis

a) Identifying the Characteristics of Agro-Industrial Entrepreneurs (MSMEs)

MSMEs (Business micro, small, and intermediate) are a variety of independent and productive businesses operated by business owners and business groups from all field economies. In general, what differentiates the business micro (BM), business small business (BS), businesses intermediate (BI), and business large (BL) is located expenses (not including land and building) and annual income (Hanim & Norman, 2018). The differences in the characteristics of MSMEs are described in the following table.

Table 1 Business Level with Expenditure and Income Indicators

Business Level	Indicator	
	Expenditure	Income
Micro	Maximum IDR 50 million	Maximum IDR 300 million
Small	> IDR 50 million – IDR 500 million	> IDR 300 million – Rp. 2.5 billion
Intermediate	> IDR 500 million – Rp. 10 billion	> IDR 2.5 billion – Rp. 50 billion
Big	> IDR 10 billion	> IDR 50 billion

Source: Hanim&Noorman, 2018

b) Analysis of Internal and External Factors

The industrial environment includes production or business conditions, including elements such as air, water, land, natural resources, flora, fauna, humans, and interactions between elements (Hermawan & Sriyono, 2020). The first step in this evaluation uses a factor evaluation matrix, namely the IFE matrix, to assess internal factors and the EFE matrix to assess external factors.

The following are the steps in classifying determining factors in the IFE and EFE matrices:

1. Find Internal and External factors

Identifying internal factors aims to find the main internal factors that will emerge as strengths and weaknesses in running a business. Meanwhile, external factor analysis aims to find the main external factors that will emerge as business opportunities and threats.
2. Determining Variable Weights and ratings

Give a weight and rating to each factor with a scale value from 1 to 4. Wakerkwa and Munandar's (2016) research used the weight and rating assessment to give a scale to a SWOT analysis based on 4 scales.

- a) Scale for weighting:
 - 1: Strongly disagree
 - 2: Disagree
 - 3: Agree
 - 4: Strongly agree
 - b) Scale for rating:
 - 1: Very unimportant
 - 2: Not important
 - 3: Important
 - 4: Very important
3. IE Matrix Stages
- The following are the stages in creating the IFE and EFE matrices:
- a. Determine the main internal and external factors, including strengths, weaknesses, opportunities, and threats.
 - b. Enter the weight determined based on the number of scales used in the research.
 - c. Give a rating on a scale of 1-4, which describes the effectiveness of the company's strategy.
 - d. Multiply the weight and rating.
 - e. Adding up the weight scores to obtain the total weight score.

To find out the weighting, ratings, and scores in the SWOT analysis, you can look at Tables 2 and 3 below.

Table 2 IFE Matrix (Internal Factor Evaluation)

Internal Strategy Factors	Weight	Ratings	Score
Strength: 1. Business experience 2. Quality product 3. Products vary	1,2,3,4	1,2,3,4	Weight x Rating
Total power			
Weakness: 1. Limited capital 2. Limited human resources 3. Simple packaging	1,2,3,4	1,2,3,4	Weight x Rating
Total weakness			
Total Internal Factors			

Table 3 EFE Matrix (External Factor Evaluation)

External Strategy Factors	Weight	Ratings	Score
Opportunity: 1. Labor available 2. Raw materials available 3. Institutional development	1,2,3,4	1,2,3,4	Weight x Rating
Total odds			
Threat: 1. Unpredictable weather 2. Increase in input prices 3. Substitute products appear	1,2,3,4	1,2,3,4	Weight x Rating
Total threat			
Total Internal Factors			

The internal-external (IE) matrix displays a combination of weighted total values covering nine cells, resulting from combining the IFE and EFE matrices. William & Mulia (2022) state that the IE Matrix places a business in a 9x9 matrix. This IE matrix has two main aspects: it utilizes the IFE matrix score as the horizontal axis (X) and the EFE matrix score as the vertical axis (Y).

c) Development Strategy Analysis (SWOT Analysis)

Strategy development business can be analyzed using SWOT analysis. SWOT analysis is a technique planning strategy designed to evaluate the company's strengths and weaknesses, opportunities, and threats (Rangkuti, 2016). According to Ervina (2023), the method SWOT analysis aims to describe conditions and situations people face in business. The SWOT approach involves the identification of an objective specific to something undertaking or business and recognizing factors from the inside and the outside that support and hinder the success of something's goals (Friesner, 2010 in Wiswastaet al., 2018).

The right alternative strategy for the company is obtained by adjusting the results of the SWOT matrix. The following are the steps for determining a strategy that is analyzed using the SWOT matrix:

- a. Compile the main internal strength factors of business people.
- b. Compile the main internal weaknesses of business people.
- c. Compile the main external opportunity factors for business people.
- d. Compile the main external threat factors for businesses.
- e. Adjust the strength factors with opportunity factors, then record them in the SO strategy.
- f. Adjust internal weakness factors with opportunity factors, then record them in the WO strategy.
- g. Adjust strength factors with threat factors, then record them in the ST strategy.
- h. Adjust weakness factors with threat factors, then record them in the WT strategy.

Table 4 SWOT Matrix

IFAS	Strength (S) identify strength factors	Weakness (W) identify factors of weakness
EFAS		
Chance (O) identify opportunity factors	SO Strategy Develop methods to exploit strengths by seizing opportunities	WO Strategy Develop methods to reduce weaknesses by exploiting opportunities
Threat (T) identify threat factors	ST Strategy Develop methods to utilize strengths by dealing with threats	WT Strategy Develop methods to reduce weaknesses and avoid threats

d) Strategy Choice Analysis (QSPM Analysis)

Matrix (Quantitative Strategic Planning Matrix) is a tool analysis used in evaluating Powerpull relative to various possible alternative actions (David, 2006 in Fatimah, 2019). According to Yanto & Nugraha (2022), with the tool analysis QSPM method, the company can find alternative strategies to apply Forapply and determine an analysis quantitative strategic planning matrix (QSPM). Elements included in the QSPM include strategic alternatives, factors key, and weight. AS (Attractiveness Score) indicates power attractiveness, TAS (Total et al.), namely the accumulation of values of Powerattr activeness, and STAS (Sum et al.), the total of these values (Maulida et al., 2021). Mark US uses a scale from 1 for fragile attraction to 4 for very strong attraction (Ma'ruf, 2022).

Table 5 QSPM Matrix

Strategy Factors (Internal external)	Weight	Strategy Alternatives					
		Strategy 1		Strategy 2		Strategy 3	
		US	BAG	US	BAG	US	BAG
Strength							
Weakness							
Opportunity							

Threat							
Total							

According to David (2016) and Maulidaet *al* (2021), the stages in using the QSPM matrix are:

1. The left column of QSPM contains the strengths, weaknesses, opportunities, and threats factors, arranged based on data from the IFE and EFE matrices.
2. Give weight to each internal and external factor according to the IFAS and EFAS matrices.
3. Review the adjustment matrix in the second stage and identify several alternative strategies that should be considered.
4. Set the Attractiveness Score (AS) and assess each internal and external factor individually. The attractiveness scale is as follows: 1 = very unattractive, 2 = not interesting, 3 = interesting, and 4 = very interesting.
5. I am calculating Total Attractiveness Score (TAS), multiplying the weight by the attractiveness value in each series. The higher the TAS value, the more attractive the strategy.
6. Calculating the Sum Total Attractiveness Score (STAS) adds all the attractiveness values in the vertical row of strategies in QSPM. The higher the STAS score, the more attractive the strategy is by considering all relevant internal and external aspects.

Results And Discussion

Characteristics of Agro-Industrial Entrepreneurs (MSMEs)

The characteristics of MSME agroindustry entrepreneurs made from seaweed are based on annual expenditure and income.

Table 6 Characteristics of Seaweed Agroindustry Entrepreneurs in Mataram City

No.	Name of Agroindustry	Expenditure (IDR)	Income (IDR/Year)	Business Characteristics
1	Ares	80,000,000	748,800,000	Small
2	Askot	35,000,000	112,320,000	Micro
3	BaleCreative	30,000,000	90,000,000	Micro
4	CharityFood	150,000,000	816,000,000	Small
5	DapurNadhira	20,000,000	72,000,000	Micro
6	Harkat Makmur	120,000,000	659,400,000	Small
7	Merpati	20,000,000	138,000,000	Micro
8	ZaturRizka	75,000,000	486,000,000	Small
9	ZidniBarokah	25,000,000	75,000,000	Micro

Source: Primary data processed, 2024

Table 4 shows the characteristics of seaweed agroindustry entrepreneurs in Mataram City, divided into two groups based on annual expenditure and income. The micro-business group comprises 5 entrepreneurs with a maximum expenditure of IDR 50 million and a maximum annual income of IDR 300 million. Meanwhile, the small business group of 4 entrepreneurs has a maximum expenditure of IDR 50 million to IDR 500 million and an annual income of IDR 300 million to IDR 2.5 billion. These criteria are supported by Hanim and Noorman (2018), who define business levels based on expenses and income, as shown in Table 1.

Identifying Internal and External Factors

A preliminary survey identified internal and external factors, resulting in 26 statement items. After validity and reliability tests, two statements were issued because they were considered invalid, leaving 24 statements. Data from 24 statements can be seen in Table 7 below.

Table 7 Internal and External Factors

Variable	Internal variable statement	Variable	External variable statement
S1	Business experience	O1	Labor is still available

S2	Have a business license and others	O2	There is guidance from related agencies
S3	Do not use preservatives	O3	There are many promotional applications available on social media
S4	Creating added value	O4	Demand for products is quite high
S6	Quality product	O5	Sufficient raw materials are available
S6	Products vary	O6	Utilizing local agricultural products
W1	Limited capital	T1	Unpredictable weather
W2	Marketing is not yet widespread	T2	The quality of raw materials is still low
W3	HR Limited	T3	Increase in input prices
W4	Technology is still simple	T4	Threat of new products from competitors
W5	Packaging is still simple	T5	There are substitute products
W6	Location is less strategic		
W7	Promotion still needs to be improved.		

Source: Primary data processed, 2024.

Information :

S = Strength

W = Weakness

O = Opportunities

T = Threat

IFAS and EFAS matrices

Internal Factor Analysis Strategy (IFAS) and External Factor Analysis Strategy (EFAS) can be used to weigh the internal and external factors of a business (Ikhsani & Rahmi, 2024). The results of the weight and rating calculations obtained the scores shown in Tables 8 and 9.

Table 8 IFAS Matrix for Micro and Small Businesses

No.	Internal Factors (Strengths and Weaknesses)	Score	
		BM	BS
	Strength		
1	Business experience	0.24	0.36
2	Have a business license, etc	0.28	0.32
3	Do not use preservatives	0.21	0.24
4	Creating added value	0.21	0.27
5	Quality product	0.21	0.30
6	Products vary	0.18	0.24
	Sub-Total	1.33	1.73
	Weakness		
1	Limited Capital	0.24	0.24
2	Marketing is not yet widespread	0.24	0.24
3	Limited human resources	0.27	0.15
4	Technology is still simple	0.24	0.28
5	Packaging is still simple	0.27	0.18
6	Location is less strategic	0.24	0.21
7	Promotion is still lacking	0.32	0.21
	Sub-Total	1.82	1.51
	Total Internal Factors	3.15	3.24

Source: Primary data processed, 2024.

Table 9 EFAS Matrix for Micro and Small Businesses

No.	External Factors (Strengths and Weaknesses)	Score	
		BM	BS
Opportunities			
1	Labor is still available	0.30	0.44
2	There is guidance from related agencies	0.40	0.27
3	There are many promotional applications available on social media	0.32	0.36
4	Product demand is relatively high	0.24	0.30
5	Sufficient raw materials are available	0.27	0.33
6	Utilizing local agricultural products	0.27	0.27
	Sub-Total	1.80	1.97
Threats			
1	Unpredictable weather	0.30	0.36
2	The quality of raw materials is still low	0.24	0.18
3	Increase in input prices	0.40	0.36
4	Threat of new products from competitors	0.24	0.27
5	There are substitute products	0.30	0.24
	Sub-Total	1.48	1.41
Total External Factors		3.28	3.38

Source: Primary data processed, 2024.

The IFAS and EFAS tables above are the results of the scores for micro and small businesses obtained by multiplying the weights and ratings. According to Qonita (2020), the IFAS Matrix assesses and gives weight to factors within the company in the form of strengths and weaknesses. Meanwhile, the EFAS matrix assesses and gives weight to factors from outside the company in the form of opportunities and threats.

SWOT diagram

Calculating the score values on IFAS and EFAS shows that the company's position is in one of the quadrants. The following is a picture of the company's position in the SWOT diagram.

1. Diagram on Micro Business

IFAS = Strengths - Weaknesses = 1.33 - 1.82 = -0.49

EFAS = Opportunities - Threats = 1.80 - 1.48 = 0.32

So the following diagram is obtained:

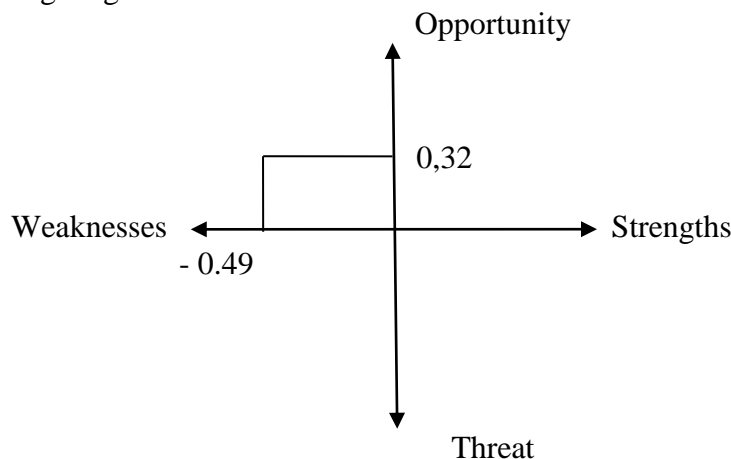


Figure 1 SWOT Diagram for Micro Businesses

Based on Figure 1 above, it can be seen that the position of the micro business development strategy is in quadrant III (WO Strategy). This strategy aims to minimize internal weaknesses by exploiting external opportunities.

2. Diagrams for Small Businesses

IFAS = Strengths - Weaknesses = 1.73 - 1.51 = 0.22

EFAS = Opportunities - Threats = 1.97 - 1.41 = 0.56

So, the following diagram is obtained.

Opportunity

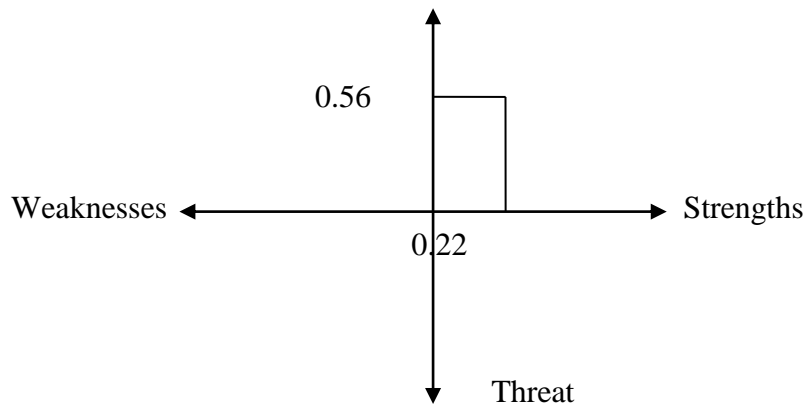


Figure 2 SWOT Diagram for Small Businesses

Based on Figure 2 above, it can be seen that the position of the micro business development strategy is in quadrant I (SO Strategy). This strategy aims to capitalize on internal strengths by exploiting external opportunities.

Development Strategy (SWOT Analysis)

SWOT analysis is a tool for analyzing seaweed agroindustry development strategies in research. According to Putra (2017), it is a planning technique used to assess a company's strengths, weaknesses, opportunities, and threats.

Based on the research results, alternative strategies for developing seaweed agroindustry businesses in Mataram City use SWOT analysis with two types of business groups: micro business groups with a WO (*Weakness—Opportunity*) strategy and SO (*Strength—Opportunity*) small business groups. *Opportunity*), as explained below.

A) WO (*Weakness – Opportunity*) Strategy for Micro Businesses:

1. Use guidance from relevant agencies to access capital, use modern technology, and develop good packaging systems.
2. They are expanding the market and promotions through social media to meet the high product demand.
3. Increase the number of human resources by utilizing the available workforce.
4. Utilize applications available on social media as a promotional tool to overcome the problem of less strategic locations.

B) SO (*Strength – Opportunity*) Strategy for Small Businesses:

1. Utilize experience and business permits to open job opportunities.
2. Make business experience and create value by processing local agricultural products.
3. We are promoting quality, varied, and preservative-free products to consumers via social media to meet the high demand for products.
4. We are striving to increase the added value of products by utilizing available raw materials, such as local agricultural products, and guidance from related agencies.

Strategy Choice Analysis (QSPM Analysis)

Quantitative Strategic Planning Matrix Analysis (QSPM) objectively evaluates a company's strategy against several threats, considering internal and external factors. (Yanto & Nugraha, 2022). According to Kusumah and Suryanah (2018), the QSPM matrix is the final stage in determining business development strategy priority options. The results of calculations using QSPM analysis can be seen in the following graph.

QSPM Graph for Micro Businesses

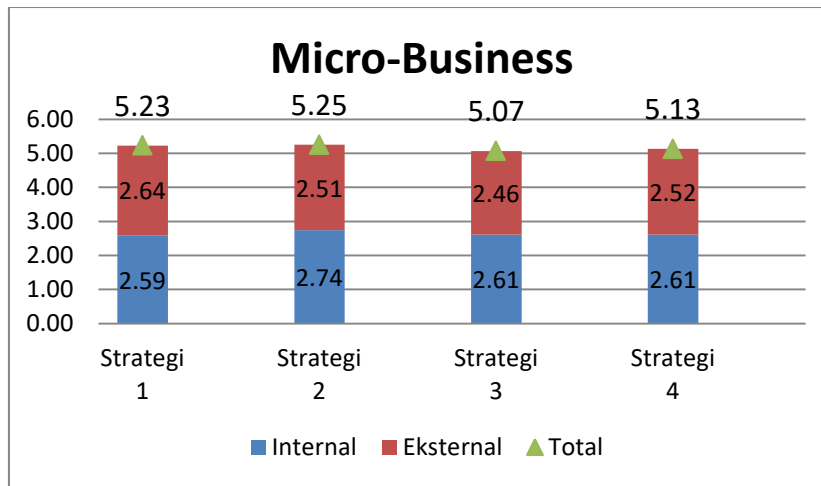


Figure 3 QSPM Graph for Micro-Businesses

The QSPM assessment criteria determine the highest value of the TAS (*Total et al.*). The higher the internal and external value obtained from each strategy, the more the strategy will become a prioritized development strategy. So, the following priority strategy for micro-business development is obtained:

1. Use guidance from relevant agencies to access capital, use modern technology, and develop sound packaging systems.
2. We are expanding the market and promoting through social media to meet the high demand for our products.
3. Increase the number of human resources by utilizing the available workforce.
4. Utilize applications available on social media as a promotional tool to overcome the problem of less strategic locations.

QSPM Graph for Small Businesses

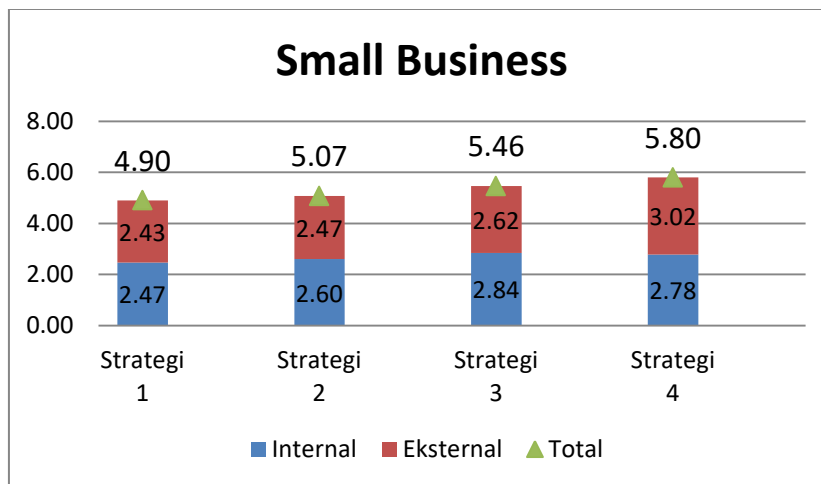


Figure 3 QSPM Graph for Small-Businesses

The QSPM assessment criteria is to determine the highest value of the TAS (*Total Attractive Score*). The higher the internal and external value obtained from each strategy, the strategy will become a prioritized development strategy. So that the priority strategy for small-business development is obtained as follows:

1. Utilize experience and business permits to open job opportunities.
2. Make business experience and create value by processing local agricultural products.
3. We are promoting quality, varied, and preservative-free products to consumers via social media to meet the high demand for products.
4. We are striving to increase the added value of products by utilizing available raw materials, such as local agricultural products, and guidance from related agencies.

Conclusions And Recommendations

Conclusion

1. The characteristics of seaweed agroindustry MSMEs in Mataram City based on expenditure and income criteria are two groups: the micro-business group with 5 entrepreneurs (Askot et al.) with a maximum expenditure criteria of IDR 50 million and a maximum annual income of IDR 300 million. Meanwhile, the small-business group has four entrepreneurs (Ares, Charity Food, Harkat Makmur, and Zatur Rizka) with expenditure criteria > IDR 50 million to IDR 500 million and annual income > IDR 300 million to 2.5 billion.
2. IE (internal-external) factors in the development of seaweed agroindustry in Mataram City are: internal factors include strengths (business experience, having business permits and others, not using preservatives, creating added value, quality products, varied products), and weaknesses (capital limited, marketing is not yet widespread, human resources are limited, technology is still simple, packaging is still simple, location is less strategic, promotion is still lacking). Then external factors include opportunities (labor is still available, there is guidance from related agencies, there are many promotional applications available on social media, demand for products is quite high, enough raw materials are available, utilizing local agricultural products), and threats (uncertain weather, quality raw materials are still low, increasing input prices, threats of new products from competitors, the existence of substitute products).
3. Alternative strategies for developing seaweed agroindustry in Mataram City using SWOT analysis, micro businesses are in quadrant III (WO Strategy), namely: (1) Utilizing guidance from related agencies in accessing capital, using modern technology and good packaging systems; (2) Expanding the market and promotions through social media to meet the high demand for products; (3) Increasing the number of human resources utilizing the available workforce; (4) Utilizing applications available on social media as a promotional tool to overcome the problem of less strategic locations. Meanwhile, small businesses are in quadrant I (SO Strategy), namely : (1) Utilizing experience and business permits to create employment opportunities; (2) Making business experience and creating added value by processing local agricultural products; (3) Promoting quality, varied and preservative-free products to consumers via social media to meet the high demand for products; (4) Striving to increase the added value of products by utilizing available raw materials in the form of local agricultural products, as well as utilizing guidance from related agencies.
4. Through calculations using the QSPM matrix, the priority strategy for developing agroindustry made from seaweed in Mataram City for the micro business group is to expand the market and promote it through social media to meet the reasonably high demand for products (Strategy 2). For small business groups, efforts are made to increase the added value of products by utilizing available raw materials in the form of local agricultural products and guidance from related agencies (Strategy 4).

Suggestion

Based on the results of research conducted in Mataram City and the results of the analysis presented, the following suggestions can be made:

1. Development strategy for micro business groups with high product demand so that entrepreneurs are expected to expand markets and promote. Meanwhile, small business groups should optimize the use of available raw materials in the form of local agricultural products to increase the added value produced.
2. The government should pay more attention and provide more guidance in the process of developing seaweed agroindustry businesses because MSMEs need direction and training from business-related agencies.

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