Strategy for Developing Milkfish Commodity in Wadak Lor Village, Duduk Sampean District, Gresik Regency

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Abstract

This research aims to analyze the development strategy for milkfish commodity in Wadak Lor Village, Duduk Sampean District, Gresik Regency, East Java. Wadak Lor Village was chosen as the research location due to its extensive pond area of 347.280 hectares and its status as one of the largest milkfish producers in East Java. Data collection methods included interviews, questionnaires, observation, and documentation, with respondents consisting of 5 native milkfish farmers from Wadak Lor Village. Data analysis utilized the SWOT (Strengths, Weaknesses, Opportunities, Threats) approach with IFE (Internal Factor Evaluation) and EFE (External Factor Evaluation) matrices to identify internal and external factors affecting milkfish cultivation. The analysis results revealed that the main strengths are the distinctive taste and long-lasting quality of the milkfish, while the primary weaknesses are inadequate irrigation infrastructure and the lack of direct marketing channels. Key opportunities include high demand for milkfish and stable selling prices, whereas the main threats are climate change and water pollution. Based on the SWOT analysis, the recommended strategies are facilitating post-harvest processing, improving irrigation infrastructure, and addressing water overflow through the construction of bore wells and protective nets. These strategies are expected to enhance product value, support business sustainability, and optimize milkfish production in Wadak Lor Village.

Keywords: milkfish, cultivation, development, SWOT, strategy

Introduction

Indonesia is a maritime country, whose territory and climate support the development of the fisheries sector. Indonesia's fisheries sector is very diverse, from catches to culture, all of which can be successfully applied in Indonesia. Fisheries refers to all activities related to the management and utilization of marine and environmental resources, ranging from pre-production to post-production and sales in fisheries management systems (Dasairy et al., 2023). Fisheries cultivation is expected to make a significant contribution to the fishery production process in Indonesia. Fisheries in Indonesia are divided into three categories: saltwater, freshwater, and brackish water. Among the three categories, brackish water pond cultivation has the most advantages, namely that the production process can be controlled and the harvesting is easy (Aulia, 2021). Pond cultivation until now is considered a business that can provide extraordinary income. The tendency in this direction is indeed reasonable because it is proven that newly cleared lands can produce production, both at the level of mastery of cultivation technology which is still low to moderate. Several fishery commodities from pond cultivation have great potential and have the prospect of being developed as superior export commodities to contribute to improving people's living standards such as milkfish (Tahir, 2023).

Milkfish is one of the fishery resources produced from pond cultivation. Advances in maintenance techniques have developed rapidly, so that the production of milkfish in ponds has been able to reach 2,000 kg/ha/year. Milkfish is one of the leading commodities cultivated in ponds, this is because farmers switch to milkfish cultivation because there are frequent shrimp harvest failures due to *white spot* diseases that attack the product. Most people choose to cultivate milkfish because it suits the local environment, is easy to maintain, and the harvest period is short, only once or every six months. Moreover, milkfish already has its own buyers, both local and sent out of the region.

The development of milkfish farming is highly dependent on the availability of quality broodstock and quality seeds (Mujtahidah et al., 2023). The development of the milkfish aquaculture fishery business aims to clearly determine the capital or investment needed to carry out pond production operations in each planting season or year. In general, fishery farmers can determine the income and profits achieved as well as the period of return on capital.

Gresik Regency, East Java is one of the centers of fish production in Indonesia. The northeastern region of Java produces around 39,545 tons of milkfish every year. The land area is 32,000 hectares or about 46% of the total pond area in East Java. Gresik Regency is one of the producers of mackerel in East Java, and the area is suitable for developing a milkfish pond business because of its great fishing potential. The presence of business development in this region will have a positive impact on the economy and the welfare of the surrounding community. In addition, job opportunities will be wider in the area, so that workers from the surrounding areas can do milkfish cultivation business.

Milkfish is one of the fishery commodities that has a fairly high added value. The nutritional content in milkfish depends on the age of the fish, the type of food given, habitat and living environment (Haikal et al., 2023). Milkfish can generally be harvested 1 year 2-3 times, the application of proper cultivation can certainly create profits for the milkfish business. The application of milkfish cultivation to obtain superior quality needs to be done with caution because the occurrence of pests and diseases in milkfish is of unknown origin. Through this, it can pose a risk to the level of milkfish productivity produced. In order to find out the position of milkfish cultivation in Wadak Lor Village, Sitting Sampean District, Gresik Regency, it can be done by implementing a development strategy in the form of a SWOT analysis. By identifying existing strengths, weaknesses, opportunities, and threats, as well as facing emerging challenges, appropriate development strategies can be formulated to improve the yield and quality of milkfish cultivation (Setiawan, 2024). The main objectives of this strategy are to increase the income of pond farmers, create more jobs, strengthen the competitiveness of milkfish products, and maintain the continuity of the business. The purpose of this study is to analyze the potential development of milkfish commodities and identify factors that affect the success of milkfish cultivation in Wadak Lor Village.

Materials and Methods

This research was conducted in Wadak Lor Village, Duduksampean District, Gresik Regency, which was deliberately chosen because it has a pond area of 347,280 ha out of a total village area of 350,138 ha and is one of the largest milkfish producers in East Java. The respondents consisted of 5 native milkfish farmers from Wadak Lor Village who understood milkfish cultivation and processing. Data collection includes primary data through interviews, questionnaires, direct observations to ponds, and documentation, as well as secondary data from e-journals, books, and related articles (Sugiyono, 2013). Data analysis uses a SWOT approach with IFE (*Internal Factor Evaluation*) and EFE (*External Factor Evaluation) matrices* to evaluate strengths, weaknesses, opportunities, and threats to formulate a strategy for the development of milkfish commodities in Wadak Lor Village. The process that must be carried out in making a SWOT analysis so that the decisions obtained are more appropriate need to go through various stages as follows (Setiawan, et al., 2023):

1. The stage of data collection for the evaluation of external and internal factors
2. The analysis stage is the creation of an internal, external matrix and a SWOT matrix.
3. Stage of research results.

Table 1. Internal and External Strategy Factor Matrix

Internal and External Strategy Factors	Rating	Weight	Score (Rating x Weight)
Strengths/ Weaknesses 1. 2.			
Total Strength and Weakness Score		1	
Opportunities/ Threats 1. 2.			
Total Opportunity/Threat Score		1	

Source: Rangkuti, 2018

Based on table 1, give a rating for each factor in column 2 based on the response of the research sample to these factors, then give a weight to each of these factors whose number should not exceed the total score of 1 in column 3 with the following formula:

$$Weight = \frac{Rating\ x\ Total\ Weight}{Total\ Rating}$$

Then lastly, multiply the weight of each factor by the rating to get the score in column 4. After obtaining the data and multiplying the weight results, the next step is to create a SWOT matrix table.

Table 2. SWOT Matrix

	Strenghts (S) (Determining 5-10 Factors Internal Strength)	Weaknesses (W) (Determining 5-10 Factors Internal Weaknesses)
Opportunities (O) (Determining 5-10 Factors External Opportunities)	Strategi SO (Create a Force strategy to capitalize on opportunities)	Strategi WO (Create a Strategy that minimizes weaknesses to take advantage of opportunities)
Threaths (T) (Determining 5-10 Factors External Threats)	Strategi ST (Create a Force Strategy to Address Threats)	Strategi WT (Create a Strategy that minimizes weaknesses and avoids threats)

Source: Rangkuti, 2018

Result and Discussion

1. Internal Factor Evaluation Analysis (IFE)

Table 3. IFE Analysis

No.	Internal factor indicators	Weight	Rating	Score Weight
Strength				
1.	Milkfish cultivation carried out environmentally friendly	0,1076923	2,8	0,3015385
2.	The milkfish products produced have a distinctive, delicious and savory taste	0,1384615	3,6	0,4984615
3.	The milkfish products produced have durable quality that does not spoil quickly	0,1153846	3	0,3461538
4.	Milkfish cultivation is easy to maintain	0,1153846	3	0,3461538
Total		0,4769	12,4	1,4923077
Weakness				
1.	Inadequate irrigation infrastructure	0,1076923	2,8	0,3015385
2.	Farmers do not have direct marketing channels to fish markets	0,1461538	3,8	0,5553846
3.	There are no post-harvest activities for milkfish products	0,1153846	3	0,3461538
4.	The location of the fish auction is far from the location of milkfish cultivation land	0,1538462	4	0,6153846
Total		0,5230769	13,6	1,8184651
Total IFE		1	26	3,3107692
Difference				-0,4

Source: Data Processed, 2025

The IFE matrix is obtained by identifying internal factors that include strengths and weaknesses that occur in the business. Determining the factors in each IFE matrix indicator requires prior identification in order to determine the right strategy to prevent and minimize losses due to business activities (Husain et al.,

2020). The completion of the calculation of the IFE matrix can be done by calculating the weight obtained from the number of respondents' answers on each question indicator divided by the respondent's total answers both from strengths and weaknesses. Weight determination can affect the quality of the information produced, one of which is as an alternative to decision support (Utsalina & Primandari, 2020). The rating is obtained from the calculation of the total answers of the respondents on each question indicator divided by the number of respondents, while the score weight is obtained from the weight multiplied by the weight. The results of the score weight calculation are used to find out where milkfish cultivation in Gresik Regency is located so that the right strategy can be found to make this cultivation more optimal to obtain income (Tahir, 2023).

Based on table 3. It can be seen that the results of the calculation of the IFE matrix consisting of strengths and weaknesses obtained a total value of 3.31 which is divided into a total strength of 1.49 while the total weakness is 1.82. The strength factor of milkfish cultivation is dominated by indicators that state that the milkfish products produced have a distinctive, tasty and savory taste so that they obtain a score weight of 0.489, which is influenced by water conditions. If the water conditions are salty, which in June-November can indirectly affect the taste of milkfish to become more salty. Likewise, vice versa, if in December-May the water condition becomes fresh so that milkfish products in Wadak Lor Village, Sitting Sampean District, Gresik Regency. Through this statement, it can be concluded that water and environmental conditions affect milkfish products, especially in the taste aspect. The weakness factor is dominated by indicators that state that the location of the fish auction is far from the location of the milkfish cultivation land with a score weight of 0.615 because the fish auction is in Lamongan so that to obtain fish, it is necessary to take milkfish by distributors and agents.

2. External Factor Evaluation Analysis (EFE)

Table 4. EFE Analysis

No	External factor indicators	Weight	Rating	Score Weight
Opportunity				
1.	Milkfish selling price is stable	0,13953488	3,6	0,50232558
2.	High demand for milkfish	0,13953488	3,6	0,50232558
3.	Creating jobs for local residents	0,13953488	3,6	0,50232558
4.	Low Competitive Level of Milkfish Products	0,09302326	2,4	0,22325581
Total		0,51162791	13,2	1,73023256
Threat				
1.	Climate affects milkfish production	0,15503876	4	0,62015504
2.	Lack of government support through fisheries outreach	0,14728682	3,8	0,55968992
3.	Pests greatly affect milkfish production	0,10077519	2,6	0,2620155
4.	High water pollution can affect water quality in milkfish cultivation land	0,08527132	2,2	0,1875969
Total		0,48837209	12,6	1,62945736
Total EFE		1	25,8	3,35968992
Difference				0,1

Source: Data Processed, 2025

The EFE matrix is used to identify external factors that occur in the company, including opportunities and threats. Data processing with IFE and EFE matrices can function to narrow the occurrence of internal and external factors. These two matrices focus more on the business conditions that occur in milkfish cultivation. The application of the matrix can be used as a big picture of efforts to make it easier to conduct a more intensive and in-depth analysis of a problem (Setyorini, 2017).

Based on table 4. It can be seen that milkfish cultivation in Wadak Lor Village, Sitting Sampean District, Gresik Regency obtained a total value of 3.35 which is divided into total opportunities of 1.73 while total threats are 1.62. The opportunity factor of milkfish cultivation is dominated by marketing and a fairly high demand of 0.5 because the cultivated fish have differences in terms of quality and taste. The price of milkfish that varies will follow the amount of demand, if the price is stable, the amount of demand will remain the same or may be higher. Meanwhile, the threat factor that can affect milkfish cultivation activities is climate of 0.62. Climate is the main factor in determining the success of milkfish cultivation, a fluctuating climate can accelerate the growth of milkfish

3. Analysis of Milkfish Development Strategy

Strenght

1) Milkfish cultivation carried out without the use of chemical fertilizers

By excluding chemical fertilizers from the cultivation process, farmers in Gresik can maintain the sustainability of the aquatic environment and support the health of the local ecosystem. This step not only creates added value to Gresik milkfish products, but also strengthens the positive image of agricultural products in the region. Organic cultivation tends to attract the attention of consumers who increasingly appreciate the sustainability and health of food products. Thus, environmental sustainability, positive response from the market, and the unique identity of Gresik milkfish cultivation that is free from chemical fertilizers can be a major strength, providing high competitiveness and making such cultivation a model for more sustainable agricultural practices at the local and possibly national levels.

2) The milkfish produced has a distinctive, delicious and savory taste

The power of milkfish produced with a distinctive, delicious, and savory taste creates a unique attraction to the product. By creating a special taste experience, milkfish cultivation has the potential to differentiate itself in the market and captivate consumers. This unique taste not only satisfies consumer tastes, but also creates customer loyalty that is fundamental to product quality. The distinctive and delicious taste not only creates satisfaction for consumers, but can also be a powerful marketing tool, helping milkfish products to compete in an increasingly competitive market. Thus, success in creating delicious and different milkfish products can be a major force in building a positive image and dominating the market share.

3) The milkfish produced has a long-lasting quality

The long-lasting quality of the product creates significant added value for consumers, providing assurance that the product can be stored and enjoyed for a longer period of time without sacrificing its quality. Long-lasting quality also allows for more efficient distribution and market expansion, as products can reach consumers in multiple locations without experiencing any degradation in quality.

4) Milkfish cultivation is easy to maintain

The simple and easy-to-care cultivation process allows farmers to focus on other aspects that can improve productivity and yield quality. The availability of easily accessible resources and uncomplicated maintenance can reduce operational costs, allowing farmers to achieve higher levels of efficiency.

Weakness

1) Inadequate irrigation infrastructure

Irrigation is an artificial water flow system as an effort to provide water to support water needs in pond land. In the milkfish cultivation activities carried out in Wadak Lor Village, the main water acquisition is obtained from the flow of water flowing in the irrigation canal. According to (Mustika & Moerhayati, 2020) the right irrigation arrangement if the flowing water discharge can be controlled and can be used optimally.

The cultivation of milkfish fisheries in Wadak Lor Village, Sitting Sampean District shows that there are obstacles in irrigation infrastructure. The obstacle referred to here is poor irrigation management, as indicated by the fact that during the long dry season the pond land in Wadak Lor Village experiences drought due to the absence of water, and during the rainy season Wadak Lor Village experiences excess water. In overcoming this poor irrigation obstacle, the milkfish farmers in Wadak Lor Village overcome this problem by accepting it as it is, when there is no water in this dry season, the farmers of Wadak Lor Village vacate their land. According to the farmer, in addition to the lack of water during the dry season, it can be used by farmers for land drainage. Then in overcoming excess water during the rainy season, milkfish farmers in Wadak Lor Village do not have the right solution.

2) Farmers do not have direct marketing channels to fish markets

The milkfish harvest distribution system that occurs in Wadak Lor Village is that farmers who have milkfish crops hand over their crops to second hands or intermediaries, then these intermediaries distribute the results to the fish auction market, after the harvest is sold at the fish auction market, then the intermediary returns to the field to give the proceeds of sales to milkfish farmers. The reason why this milkfish farmer in Wadak Lor Village does not want to go directly to the market to auction his fish is because the farmer of Wadak Lor Village feels that there is no buyer who is able to sell his fish at the maximum price if the farmer directly auctions the fish, the milkfish farmer is afraid of being lied to and the fish will be sold at an unsatisfactory price, or it could be that the milkfish harvested does not sell well at the fish auction market.

3) There are no post-harvest activities for milkfish products

The selling value of milkfish will be more economically valuable if it meets the needs and desires of consumers. The main weakness of milkfish is its many spines and small spines found all over the body. making it difficult to consume. Actually, this fish has a very high potential and can provide processed fishery products that have high nutritional value content and high additional income if utilized and have economic value. The majority of the people of Wadak Lor Village work in milkfish cultivation activities, either as owners, workers or maintaining milkfish ponds. Wadak Lor Village, when harvesting agricultural products, namely milkfish, is all marketed directly to the fish market without processing to obtain added value.

4) The location of the fish auction is far from the location of milkfish cultivation land

From the results of the interviews that have been conducted, the location of this milkfish auction is in Lamongan City where to get to the fish auction location takes about 40 minutes - 1 hour. The risk faced is the constraint of timeliness to enter the fish auction market, the untimely will have an impact on the unsatisfactory selling price of milkfish.

Opportunity

1) Milkfish selling price is stable

The stability of milkfish selling prices provides significant benefits for fisheries industry players and consumers. With fixed and controlled prices, milkfish producers can better plan their production, creating sustainability in their ventures. Price stability also provides certainty for milkfish farmers, encouraging them to improve the quality and quantity of production without worrying too much about extreme market fluctuations. On the consumer side, stable selling prices create trust and consistent product availability in the market. People can comfortably access milkfish without worrying about sudden price spikes. This price stability can also encourage milkfish consumption, providing widespread health benefits to the community. Thus, the stability of milkfish selling prices not only creates economic sustainability in the fishery industry, but also has a wide positive impact on both parties, namely producers and consumers.

2) High demand for milkfish

The high demand for milkfish reflects the popularity and attractiveness of milkfish in the market. The popularity of milkfish comes not only from the delicious taste of its meat, but also from its high nutritional value. The public recognizes the health benefits of consuming milkfish, which is rich in omega-3 fatty acids, high-quality protein, and various other important nutrients. In recent years, this high demand has driven the growth of the fishery industry and milkfish farming. Milkfish farmers and producers are trying to meet market needs by increasing production and innovation in pond management. In addition, support from the government and public awareness of the importance of maintaining the sustainability of marine resources also contribute to the increasing demand. With high demand, the milkfish fishery sector has become one of the driving forces of the local and national economy, providing significant economic benefits and empowering milkfish pond farmers.

3) Creating jobs for local residents

Creating jobs for local residents is an important step in building economic sustainability and improving community welfare. With job opportunities available in the region, locals can enjoy direct economic benefits. This not only helps reduce the unemployment rate, but also increases people's purchasing power and living standards. Providing relevant skills training and education can be key in ensuring that local residents have the skills that suit the needs of the job market. In addition, a collaborative approach between the government, the private sector, and community institutions can strengthen efforts to create sustainable jobs and have a positive impact on local economic growth. In this way, the surrounding community can feel the direct positive impact of economic development, creating a more stable and prosperous environment.

4) Low Competitive Level of Milkfish Products

The low level of competition of milkfish products provides a significant competitive advantage for producers and fishery industry players. With limited competition, the opportunity to develop market share and maintain product advantages becomes easier. Manufacturers can focus on quality improvement and innovation in the production process without having to worry too much about fierce price competition. It also creates opportunities to build a strong brand and a good reputation in the market, as consumers tend to be loyal to products that are consistent and of guaranteed quality. Low levels of competition can also stimulate local economic growth, as producers and industry players have the potential to collaborate more effectively, share resources, and improve the sustainability of their businesses. Therefore, this situation

creates a stable environment and supports growth for both industry players and consumers, creating a win-win situation in the milkfish product market.

Threat

1) Climate affects milkfish production

The threat caused by climate change to milkfish production in Gresik is a serious challenge that needs attention in the management of aquaculture. Climate change can impact water temperatures, seasonal patterns, and rainfall, all of which play a crucial role in the success of milkfish farming. Significant increases in water temperature or extreme fluctuations in weather patterns can result in stress in milkfish, affecting their diet, reproduction, and growth.

Climate variability can also cause uncertainty in the milkfish's reproductive cycle. Changes in the breeding season and environmental conditions can affect the survival rate of larvae and juvenile milkfish, which has a direct impact on overall production. These factors create additional challenges for milkfish farmers in Gresik, who have to adapt to increasingly unstable climatic conditions.

Additionally, extreme weather such as storms, floods, or droughts caused by climate change can damage pond infrastructure and result in significant losses in milkfish production. Therefore, a holistic approach is needed that involves changes in cultivation practices, the use of advanced technology, and mitigation efforts to increase the resilience of milkfish cultivation to climate change in Gresik.

2) Lack of government support through fisheries outreach

The absence of government support through fisheries extension from the Agricultural Extension Center (BPP) in Gresik is a serious threat to the development of the fisheries sector in the area. Fisheries extension carried out by BPP has a key role in providing the latest information, skills, and technology to fishery business actors, including milkfish farmers in Gresik. Without adequate support and counseling, fishery farmers may find it difficult to access the knowledge needed to improve their productivity and well-being.

The direct impact of the absence of fisheries extension can be seen in the increased risk of wrong farming practices, inefficient management, and lack of understanding of the latest developments in fisheries technology. This can have a negative impact on milkfish production, competitiveness in the market, and the sustainability of the fisheries sector in Gresik as a whole.

The importance of government support through fisheries extension by BPP in Gresik lies in understanding and adapting to the latest developments in the fisheries sector. This counseling can include sustainable practices, good fishery resource management, and ways to deal with specific challenges in milkfish farming. By providing the necessary resources and information, the government can play a key role in ensuring that fisheries farmers in Gresik can run their businesses efficiently, sustainably, and competitively

3) Pests greatly affect milkfish production

The threat from pests in the context of milkfish cultivation can be a factor that affects production yields, although it may not be directly detrimental significantly. However, it is important to understand that the impacts of the presence of pests can accumulate over time and affect the health and productivity of milkfish. Some aspects that need to be considered in the discussion of pest threats that are not too detrimental but still require attention involve decreased growth, the potential for the spread of diseases, damage to the cultivation environment, and control costs that may occur. Effective understanding and handling of the pest remains important in maintaining the health and success of milkfish production as a whole, even if the impact may not initially seem very detrimental.

Therefore, while pests may not be immediately detrimental, it is important to implement proper control measures. Good pest management can involve careful monitoring, the application of correct cultivation techniques, and the use of environmentally friendly control methods to minimize the negative impact on milkfish health and overall production.

4) High water pollution can affect water quality in milkfish cultivation land

The high level of water pollution in milkfish cultivation areas in Gresik threatens the sustainability of the fishery business. As a leading milkfish producer, Gresik faces significant challenges due to water pollution, which directly impacts water quality and milkfish production. Pollution stems from industrial, agricultural, and human waste, damaging aquatic ecosystems.

Pollution harms milkfish cultivation both directly and indirectly. Directly, poor water quality stresses milkfish, stunts growth, and increases disease risk. Indirectly, it disrupts local ecosystems, threatens biodiversity, and imbalances the environment, ultimately reducing productivity.

To address this, preventive measures and effective management are needed, such as sustainable farming practices, regular water quality monitoring, and collaboration among government, farmers, and stakeholders.

Education on clean water preservation, advanced waste management technology, and strict waste disposal regulations are key to ensuring the sustainability of milkfish cultivation in Gresik.

Table 5. SWOT Matrix

Internal Factors / External Factors	Strength (S)	Weakness (W)
	1. Milkfish cultivation carried out environmentally friendly 2. The milkfish products produced have a distinctive, delicious and savory taste 3. The milkfish produced has a long-lasting quality 4. Milkfish cultivation is easy to maintain	1. Inadequate irrigation infrastructure 2. Farmers do not have direct marketing channels to fish markets 3. There are no post-harvest activities for milkfish products 4. The location of the fish auction is far from the location of milkfish cultivation land
Opportunity (O)	S-O Strategy	W-O Strategy
1. Milkfish selling price is stable 2. High demand for milkfish 3. Creating jobs for local residents 4. Low Competitive Level of Milkfish Products	1. Optimizing the production of milkfish that has a distinctive, delicious and savory taste to meet consumer demand (S2, O2) 2. Focus on marketing the product as a high-quality option with unique taste and quality that is consistently maintained. Use price stability as an additional attraction for consumers. (S1, S2, O1, O2) 3. Collaboration with local communities to support production. Involve more local workers in the production chain and increase production capacity to meet high demand. (S1, O1, O3, O4)	1. Facilitate post-harvest processing to increase the added value of products in order to create local job opportunities and increase the competitiveness of milkfish in the market. (W3, O1, O2, O3) 2. Collaborate with parties related to the improvement of irrigation infrastructure to support the sustainability of milkfish farming in meeting the high demand for milkfish. (W1, O1) 3. Carrying out strategies such as providing nets around the land to overcome the occurrence of excess water during the rainy season, and strategies to make drilled wells to support water needs during the dry season to optimize milkfish production considering the high demand for milkfish (S1, O2)
Threats (T)	S-T Strategy	W-T Strategy
1. Climate affects milkfish production 2. Lack of government support through fisheries outreach 3. Pests greatly affect milkfish production 4. High water pollution can affect water quality in milkfish cultivation land	1. Implement good environmental management practices, focusing on sustainable and environmentally friendly cultivation principles including waste management and regular water quality monitoring. Collaboration with related parties to maintain the quality of the waters. (S1, S3, T2, T4)	1. Develop efficient distribution channels with the help of local governments. Build partnerships with government agencies that support fisheries extension and help in overcoming farmers' constraints. (W2, T2) 2. Improving irrigation infrastructure to face climate change that will occur in order to support maximum milkfish production. (W1, T1)

Source: Data Processed, 2025

SWOT analysis is a tool for strategic planning and strategic management in a business or enterprise. SWOT can be used effectively in building business and competitive strategies (Nimah & Sasongko, 2023). The formulation of strategies resulting from the SWOT analysis above is aimed at utilizing strengths and opportunities and minimizing weaknesses and threats. Its implementation must involve the community, economic actors, government and other stakeholders (Putri, 2023).

1. S-O Strategy

S-O (Strength-Opportunities) strategy is a strategy obtained from the use of strength factors and utilizing existing opportunity factors. The S-O strategy is used to develop milkfish cultivation in Duduksampeyan District, Gresik Regency. The strategy that can be applied is to optimize the production of milkfish produced which has a distinctive delicious and savory taste, focus on marketing milkfish as a high-quality choice with unique taste and quality that is consistently maintained and collaborate with local communities to support production activities.

2. W-O Strategy

W-O (Weakness-Opportunities) strategy is a strategy obtained by minimizing existing weakness factors to utilize opportunity factors. W-O (Weakness-Opportunities) strategy is used to develop milkfish cultivation in Duduksampeyan District, Gresik Regency. The strategies that can be applied are by facilitating post-harvest processing to increase the added value of milkfish and collaborating with parties related to improving irrigation infrastructure to support the sustainability of milkfish farming and implementing strategies such as providing nets around the land to overcome excess water during the rainy season, and strategies to create drilled wells to support water needs during the dry season to optimize milkfish production considering the high demand for milkfish.

3. S-T Strategy

The S-T (Strength-Threat) strategy is a strategy obtained from the use of strength factors to avoid existing threat factors. The S-T strategy is used to develop milkfish cultivation in Duduksampeyan District, Gresik Regency. The strategy that can be applied is by implementing good environmental management practices, focusing on sustainable and environmentally friendly cultivation principles.

4. W-T Strategy

The W-T (Weakness-Threat) strategy is a strategy that reduces weakness factors and avoids existing threat factors. The W-T strategy is used to develop milkfish cultivation in Duduksampeyan District, Gresik Regency. The strategies that can be applied are by developing efficient distribution channels with the help of the local government, building partnerships with government agencies that support extension and improving irrigation infrastructure to deal with climate change that will occur.

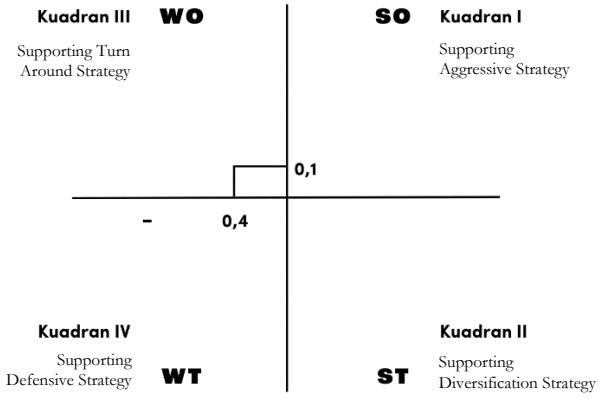

Figure 1. SWOT Diagram

Figure 1 shows the results of the SWOT diagram of the Milkfish Commodity Development Strategy in Wadak Lor Village, Sitting Sampean District, Gresik Regency contained in quadrant III, namely the W-O strategy. The strategy that needs to be implemented for these conditions is to minimize the existing weakness factors to take advantage of the existing opportunity factors. Thus, the strategic factors that must be optimized include:

1. Facilitate post-harvest processing to increase product added value. The purpose of post-harvest processing is to reduce yield loss, reduce spoilage, and increase product shelf life and ease of use to achieve added value. The added value of milkfish can be increased by providing good facilities starting from post-harvest management, distribution and when entering the market. Improving post-harvest processing is also intended to create local jobs by employing local people. Poor post-harvest processing

will reduce yields in terms of both weight and quality of the products produced, especially if harvested during the rainy season (Haris et al., 2022).

2. Collaborate with parties related to improving irrigation infrastructure. Irrigation infrastructure development is a strategic sector to meet high demand and support the sustainability of milkfish cultivation. Improving irrigation channels is important to strengthen food security, reduce poverty in rural areas, and achieve food independence, so the government is expected to play a role in developing these irrigation channels. Improving effective and efficient irrigation channels is expected to help milkfish farmers optimize agricultural production and improve economic welfare.
3. Carrying out a strategy of providing nets around the land to overcome the occurrence of excess water during the rainy season, and a strategy to make drilled wells to support water needs during the dry season to optimize milkfish production considering the high demand for milkfish.

Conclusion

The results of the IFE Matrix analysis obtained a score for the strength factor of 1.49 and a score for the weakness factor of 1.81. Meanwhile, in the EFE Matrix analysis, an opportunity factor score of 1.73 and a threat factor score of 1.62 were obtained. In the SWOT Matrix Analysis of the Milkfish Commodity Development Strategy in Wadak Lor Village, Sitting Sampean District, Gresik Regency is located in Quadrant III where, the strategy that must be implemented is the WO (Weakness-Opportunities) strategy. The strategy that needs to be implemented is a strategy that can be implemented, namely by facilitating post-harvest processing to increase the added value of products and collaborating with parties related to improving irrigation infrastructure to support the sustainability of milkfish farming and carrying out strategies such as providing nets around the land to overcome excess water during the rainy season, and strategies to make drilled wells to support water needs during the dry season to optimize milkfish production considering the high demand for milkfish.

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