

Sustainable Tuna Fisheries Management Strategy In Sendang Biru, Malang Regency, Indonesia

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-----ABSTRACT-----

Fish is a resource that can be recovered, but this fishery resource is not infinite. The availability of fish resources, especially tuna, must be managed properly in order to continue to be utilized sustainably. The purpose of this research is to provide a recommendation of tuna fisheries management policy to be utilized sustainably. The method used to determine the policy recommendation is the SWOT method. The results of this study were recommended from the formulation based on the S-O and S-T strategy component. This recommendation is based on the score of the S-O strategy component has the highest value.

KEYWORDS: SWOT, Tuna management, Tuna of SendangBiru

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I. BACKGROUND

Fish are natural resources that can be recovered, but rather than unlimited fish resources (Suseno, 2007). The availability of fish and environmental resources is very important in supporting fishing activities. Therefore, the carrying capacity and condition of fish resources must be managed wisely and maintained with the management and institutional strategies in order to keep its sustainability in nature and on the other side the fishermen can still do activities arrest. Management of tuna can not be confused with other fish resource management, this is because tuna is an export commodity that requires extra handling (Sofiati&Alwi, 2018).

The effort to use tuna in the Indian Ocean from year to year tends to increase, therefore it is necessary to do the appropriate management concept for the long term to ensure a profitable capture but preserve the fish resources The tuna can be maintained (Kurniawati *etal.*, 2016). Moreover, nowadays tuna production is still relying on the catch from nature so as to maintain its sustainability need to be done complex management strategy so fishermen can still catch tuna. Effective and precise management strategies can have a positive influence on the social and economic situation of fishermen communities, especially small-scale fishermen (Sudarmo*etal.*, 2016).

Based on this, it is necessary to do a management strategy to allow the tuna to be utilized sustainably. Due to the current tuna, the Indian Ocean has been declared overfishing (IOTC, 2018). The production of tuna in the year 2015 is 11,042,125 kg or 112% of the number of catches allowed, where the number of catch allowed is only 9,831,881 kg (Krisdiono*etal.*, 2019). Tuna fisheries at SendangBiru currently shows symptoms of overfishing and significant pressure occurred on tuna fishing marked with fishing ground distance with the farther fishing based and increasingly productive capture Descending (Jaya *etal.*, 2017; Wijayanto*etal.*, 2014). Thus, the development of sustainable tuna fisheries management strategy is the main focus on this research.

II. METHODOLOGY

This study was held in July to September 2019. The research was conducted in Sumbermanjing village, Sendang Biru Malang regency. The method used to formulate sustainable tuna fish management strategy in SendangBiru, Malang District is a survey method which is then analyzed using SWOT analysis. With SWOT analysis will be carried out the identification of sharing factors systematically to formulate management strategies (Rangkuti, 2002). The stakeholders in the interview are tuna fishermen, SendangBiru community figures, tuna observer from WWF and Ministry of Maritime and Fisheries as well as port officers and Marine and Fisheries Resource Supervisory work unit. This analysis is based on logic that can maximize strength and opportunity but can simultaneously minimize weaknesses and threats. After crafting strengths, opportunities, weaknesses and threats, it is then compiled and analyzed using external Factors Analysis Summary and IFAS (Internal Faktors Analysis Summary).

III. RESULTS AND DISCUSSION

Determination of policy recommendation using SWOT analysis will be seen from the internal factor (strength and weakness) and external (opportunities and threats) obtained from the interview results. The internal and external factors obtained are as follows.

Internal Factors

1. Strengths
 - a. Abundant tuna catch
 - b. Many workers at the port
 - c. Fisheries Management Area 573 is still potential to catch tuna fish
 - d. Strategic port Location
2. Weakness
 - a. Fishing activities not throughout the year
 - b. Post-harvest handling is less maximum
 - c. Fish auction place facility and port is still minim
 - d. Installation of fish apartment by fisherman is not detected

Eksternal Factors

1. Opportunities
 - a. Support by the government and NGOS
 - b. Market demand and tuna prices
 - c. The tuna resources are still beneficial
 - d. Many fish processing units around the port
2. Threats
 - a. The capture time is getting longer and away
 - b. Many juvenile of tuna caught by fishermen
 - c. Too much fishing fleet
 - d. Fish stock Status of tuna yellowfin was overfishing in Fisheries Management Area (FMA) 573

After acquired internal and external factors that influence on the management strategy of tuna fisheries in SendangBiru, then carried out the score calculation. The scores of each of these factors are then presented in the Matrix of IFAS (Internal Strategic Factor Analysis Summary) and EFAS (External Strategic Factor Analysis Summary).The results of a weighted analysis of internal and external factors can be seen in Table 1.

Table 1. Weight of IFAS and EFAS tuna in SendangBiru

Internal Factors	Weight	Rating	Skor
Strength			
a. Abundant tuna catch	0,14	4,36	0,60
b. Many workers at the port	0,14	3,73	0,51
c. Fisheries Management Area 573 is still potential to catch tuna	0,14	3,82	0,52
d. Strategic port Location	0,14	3,36	0,46
Total Strength	0,55		2,08
Weakness			
1. Fishing activities not throughout the year	0,09	3,36	0,31
2. Post-harvest handling is less maximum	0,14	3,54	0,48
3. Fish auction place facility and port is still minim	0,09	2,63	0,24
4. Installation of fish appartmen by fisherman is not detected	0,14	4,18	0,57
Total Weakness	0,45		1,59
Total IFAS	1,00		3,68
Eksternal Factors	Weight	Rating	Skor
Opportunities			
1. Support by the government and NGOS	0,10	3,27	0,32
2. Market demand and tuna price	0,15	3,54	0,52
3. The tuna resources are still beneficial	0,10	3,81	0,38
4. Many fish processing units around the port	0,15	3,27	0,49
Total Opportunities	0,5		1,73
Threats			
1. The capture timeisgettinglonger and away	0,15	3,27	0,49
2. Many juvenile of tuna caught by fishermen	0,10	3,36	0,33
3. Too much fishing fleet	0,10	2,27	0,22
4. Fish stock status of yellowfin tuna was overfishing in Fisheries Management Area 573	0,15	3,18	0,47
Total Threats	0,5		1,53
TotalEFAS	1,00		3,26

The results obtained in Table 10 indicate that from the internal factor analysis results obtained the score of the strength components amounting to 2.08 and the weakness score of 1.59. So the total value of internal factors has a value of 3.68. As for the external analysis factor obtained the components score opportunity 1.73 and the threat component 1.53. The total external factor value is 3.26.

The strength components that have the highest score are the abundant tuna catches (0.60) then the FMA 573 is still a potential to catch tuna (0.52). The catch became the dominant strength factor due to the catch of Sendang Biru blue fishermen so that the selling price can cover the cost of operational. Based on that, it can be said that FMA 573 which became the fishing ground of Sendang Biru fishermen still profitable.

The dominant weakness is the installation of a device by undetectable fishermen (0.57) due to the absence of officers who are responsible and specifically handle the devices. This is suspected because of the ignorance of fishermen about the rules of installation of the devices that have been regulated in the candy-KP No. 26 year 2014. Moreover, there are no special officers who feel responsible for this in the location. Even if too many devices installed will adversely affect and interfere with the flow of tuna migration. Then the lack of fishing skills in the handling of fish on board made the quality of tuna when it was landed to decline to have an impact on the selling price of fish.

Opportunities that have the dominant score value are the demand for tuna market and the high price (0.52). Tuna fish is a major export commodity in Indonesia that has a wide market share and good price. Therefore, it is necessary to do supervision to keep the price stable despite being the fish season and not season.

The dominant threat is the fishing time that is getting longer and farther (0.49). This will impact the increase in the operational costs that the fishermen will issue. And if the results are not able to cover the operational costs and this happens continuously then the fishermen will lose.

Based on the analysis results of internal and external factors obtained a combination of the strategy of the components that have the highest score Nila, then the best strategy is a combination of S-O and S-T strategy. This strategy determination map can be seen in Figure 1.

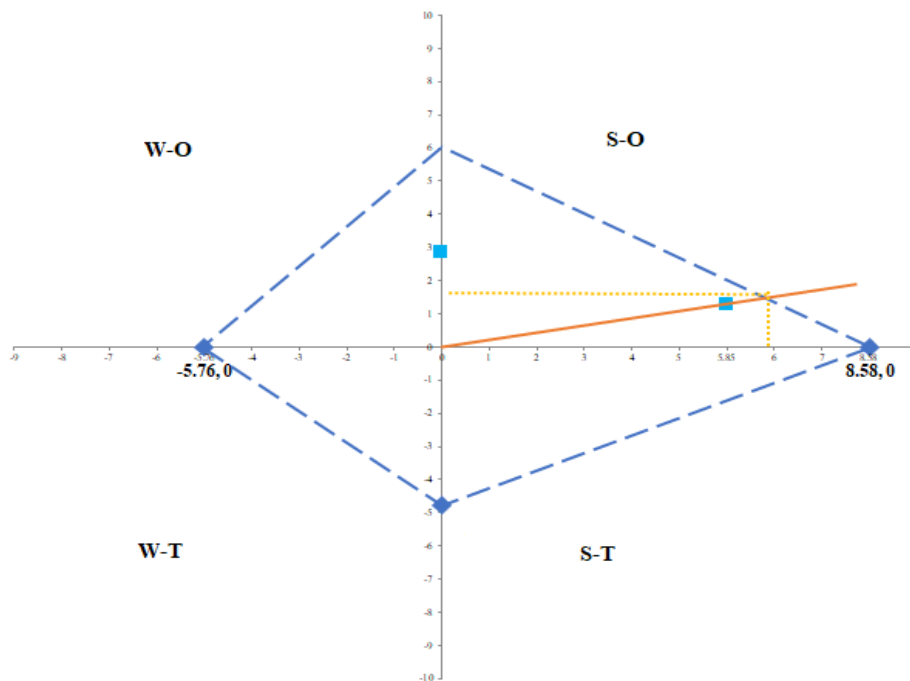


Figure 1. Map Determination of Tuna Fisheries management strategy in Sendang Biru

Based on Figure 1 it is known that large S-O and S-T strategies are not very significant. Therefore, the recommended management strategy will be formulated based on the combination of both components.

Further, the formulation of SWOT matrix to be carried out the best policy recommendation. The formulation of the SWOT matrix will result in four strategy categories i.e. S-O strategy to optimize opportunities, W-O strategy to minimize weaknesses, S-T strategy to reduce the impact of threats and the W-T strategy to avoid threats at once Reduce weaknesses. SWOT based analysis of IFAS and EFAS can be seen in Table 2.

Table 2. SWOT strategy Development and management of Tuna fisheries in SendangBiru

IFAS EFAS	<p><u>Strength</u></p> <ol style="list-style-type: none"> Abundant tuna catch Many workers at the port Fisheries Management Area 573 is still potential to catch tuna Strategic port Location 	<p><u>Weakness</u></p> <ol style="list-style-type: none"> Fishing activities not throughout the year Post-harvest handling is less maximum Fish auction place facility and port is still minim Installation of fish appartmen by fisherman is not detected
<p><u>Opportunities</u></p> <ol style="list-style-type: none"> Support by the government and NGOS Market demand and tuna price The tuna resources are still beneficial Many fish processing units around the port 	<p><u>S-O</u></p> <ol style="list-style-type: none"> Stabilizes the price of tuna; Diversification products for tuna reject. 	<p><u>W-O</u></p> <ol style="list-style-type: none"> Improve the quality of fish aboard with good on board handling application; Perform the arrangement of the regulation of the complex in accordance with applicable regulations
<p><u>Threats</u></p> <ol style="list-style-type: none"> The capture timeisgettinglonger and away Many juvenile of tuna caught by fishermen Too much fishing fleet Fish stock status of yellowfin tuna was overfishing in Fisheries Management Area 573 	<p><u>S-T</u></p> <ol style="list-style-type: none"> Socialization of the impact of overfishing to fishermen tuna; Perform surveillance patrol periodically (Satker PSDKP); 	<p><u>W-T</u></p> <ol style="list-style-type: none"> Provide an alternative livelihood to the family of tuna fishermen during the Paceklik season; Restrict new ship's addition permit

In Table 2 obtained formulation of tuna fishery management plan that will be recommended to the local government. Suggested recommendations that will be given consecutively come from S-O, S-T, W-O and W-T components. This recommendation sequence is derived from the total score of each component.

IV. CONCLUSION

The sustainable of tuna management strategy in Sendang Biru can be done by:

- Stabilizes the price of tuna;
- Diversification products for tuna reject.
- Socialization of the impact of overfishing to fishermen tuna;
- Perform surveillance patrol periodically (Satker PSDKP);
- Improve the quality of fish aboard with good on board handling application;
- Perform the arrangement of the regulation of the complex in accordance with applicable regulations
- Provide an alternative livelihood to the family of tuna fishermen during the Paceklik season;
- Restrict new ship's addition permit

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