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EAFM (ECOSYSTEM APPROACH TO FISHERIES MANAGEMENT) SOCIAL DOMAIN ASSESSMENT AT THE FISHING BASE OF LAMPU SATU COAST, MERAUKE

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ABSTRACT

The social domain is one of the important domains in EAFM (Ecosystem Approach to Fisheries Management), which has the aim of ensuring the social welfare of fisheries communities such as high participation of stakeholders, minimal social conflicts in fisheries communities, and high utilisation of local knowledge in managing fisheries resources. This study aims to assess the status of stakeholder activeness, Fisheries Conflict Status and Existence Status and the effectiveness of local knowledge application in fisheries resource management based on EAFM social domain. This research was conducted at the fishing base of Merauke light beach one in 2024. The population in this study were fisheries communities and stakeholders in fisheries management. Sample withdrawal based on Roscoe as many as 34 respondents. Data analysis method using EAFM indicator domain assessment was analysed using multi criteria analysis (MCA) approach, which is an approach to convert qualitative data into quantitative. The results showed that stakeholder activeness was at poor criteria and given a red flag, Fisheries Conflict was at poor criteria and given a red flag, the existence and effectiveness of the application of local knowledge was at moderate criteria and given a yellow flag.

Keywords: Fisheries Conflict, Stakeholder Participation, Local Knowledge

INTRODUCTION

Fisheries Law number 45 of 2009 directs that in order to realize sustainable fisheries, fisheries management needs to be carried out. The use of sustainable fishery resources is very necessary so that existing fishery resources can continue to be used and also in the context of recovering degraded fishery stocks (Ward, 2000; Garcia & Rosenberg, 2010).

Ecosystem Approach to Fisheries Management (EAFM) is an approach that maintains a balance between socio-economic goals and ecosystem sustainability through sustainable and integrated fisheries management. The EAFM approach is very important to be implemented to move towards sustainable Indonesian fishery resources in order to prosper the community (FAO, 2003).

The social domain is one of the important domains in EAFM, which aims to ensure the social welfare of the fisheries community such as high participation of stakeholders, the lack of social conflicts in the fisheries community, and the high utilization of local knowledge of the community in managing fishery resources. There are 3 indicators in the social domain that are

parameters in fisheries management, namely: Stakeholder participation, social conflicts of fisheries communities and the use of local knowledge in managing fishery resources (Sari, 2022).

The participation of stakeholders is very important because the success rate of SDI management is seen from the activeness of stakeholders (Adrianto, 2014; Muliawan, et. All 2014). In the management of fishery resources, the participation of the community and stakeholders is needed in order to be able to utilize fishery resources optimally without harming other stakeholders, so that the welfare of the community increases (Muthmainnah, 2011). Therefore, information about fisheries resource management is very important to be an input in making fisheries management policies. (Dwirastina 2019).

The ability to identify potential social conflicts of fisheries communities in fishery resource management activities is important in the development of fishery resource management programs (Mustamin 2016). Conflicts are measured based on the number of conflicts that occur, if the frequency of conflicts that occur is very high, the more difficult it is to manage fishery resources (Sari, 2022). Conflicts occur if the goals of the community are not the same, conflicts that occur in the community can be resolved by a win-win solution that does not harm all parties. (Fisher, 2001; Mustamin 2016).

The local knowledge of the fisheries community in the management of fishery resources is essentially a process of controlling the attitudes of the communities around the area so that the use of fishery resources can be done wisely by heeding the rules of environmental sustainability (Supriharyono, 2002). The activities of the fisheries community are greatly influenced by the local knowledge of the fisheries community in the management of fishery resources, the presence or absence of local knowledge will be followed by the effectiveness of the application of local knowledge by the fisheries community. This greatly determines the success of fishery resource management (Natasya et al. 2018). Local knowledge of the fishing community related to the use of fishing gear, fishing grounds and regulations on fishing areas (Sari, 2022).

This study aims to assess the status of the spatial domain through the EAFM (Ecosystem Approach to Fisheries Management) approach.

MATERIAL AND METHOD

Study Area

This research was conducted in Samkai Village, Merauke District. This research was carried out for 3 (three) months, from July 2024 to September 2024.

Sampling

The sampling technique used in this study is pruposive sampling where this technique aims

to be a barrier for a respondent criterion that the researcher wants. The sample was drawn using Roscoe, so the number of samples was 34 respondents.

Data Source

The data sources used in this study are primary and secondary data.

1. This primary data was obtained from the results of interviews with respondents, questionnaire data, direct observation data in the field, and documentation at locations carried out in Samkai Village. The primary data includes:
   a. Stakeholder participation in fisheries resource management
   b. Fisheries conflicts that occur in the management of fishery resources
   c. Types of local knowledge and the effectiveness of local knowledge in fisheries management
2. Secondary data is obtained by researchers directly through intermediary media that are obtained and recorded by others. In this study, the secondary data used are as follows:
   a. Demographic data
   b. Map of the research location
   c. General circumstances of the research site
   d. Research documentation

Data Analysis

The assessment of the EAFM social domain indicators was conducted using a multi-criteria analysis (MCA) approach, which converts qualitative information into quantitative index values (Budiarto, 2015 in WCS, 2018). Three indicators were assessed: stakeholder participation, fisheries conflict, and utilization of local knowledge. Each indicator was evaluated using an ordinal 3-point Likert scale, where scores reflect low (1), moderate (2), and high (3) performance based on predefined criteria.

For stakeholder participation, scores were assigned based on the frequency of stakeholder involvement in fisheries management activities (<50% = 1; 50–75% = 2; >75% = 3), with a weighting factor of 40%. For fisheries conflict, scores were determined based on the annual frequency of conflict occurrences (>3 incidents = 1; 2–3 incidents = 2; 1 incident = 3), with a weighting factor of 35%. For the utilization of local knowledge, scores were assigned based on its existence and effectiveness (none = 1; exists but ineffective = 2; exists and effective = 3), with a weighting factor of 25%.

The index value for each indicator was calculated by multiplying the score by its respective weight. All indicator index values were then summed to obtain a composite social domain index, which was subsequently classified into three performance categories (poor,

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moderate, and good) and visualized using a flag model.

RESULTS AND DISCUSSION

Evaluation Social Domain EAFM (*Ecosystem Approach to Fisheries Management)*

Stakeholder Participation

Stakeholder participation in this study is the involvement of stakeholders in a series of fisheries management activities at the Fishing base of Lamp Satu Merauke beach.

The assessment was carried out for eight stages of fisheries management that are in accordance with the mandate of the fisheries law, namely: 1) Data information collection, 2) analysis, 3) planning, 4) consultation, 5) decision making, 6) allocation of fish resources, 7) implementation and 8) law enforcement of laws and regulations in the fisheries sector (Davis & Hanich, 2020).

The mean stakeholder participation rates across the eight fisheries management stages were suboptimal, ranging from 32.35% (data analysis and law enforcement) to 47.06% (decision-making and implementation), with specific averages of 40.43% for data collection, 44.12% for planning, and 38.24% for both consultation and fish resource allocation. All rates fell within poor criteria (Puluhulawa et al., 2023). This indicates a critical need for enhanced engagement strategies, as effective stakeholder involvement is highly influential in achieving robust fisheries management outcomes (Ninef et al., 2018).

The mean stakeholder participation in fisheries management at the Pantai Lamp Satu fishing base was 30.00%, indicative of poor criteria (Suharno et al., 2020).

Fisheries Conflict

According to Johnson (Supratiknya, 1995) conflict is a situation in which the actions of one party have the effect of hindering, hindering or interfering with the actions of the other party. Fisheries conflicts in this study are conflicts over fishing areas, conflicts over fishing gear, conflicts between policies and conflicts over the distribution of fuel oil for fishermen. The results of interviews on conflicts that occurred to fishermen at the Merauke Lamp Beach fishing base were 20 cases of conflict in the past year, this shows that fisheries conflicts at the fishing base are in poor criteria. The fisheries conflicts that occurred were as follows:

1. Fisheries conflicts related to the seizure of fishing areas are 9 times in one year. In this case, a 15 GT vessel catches in the catchment area intended for 5 GT vessels and a 5 GT fishing vessel catches in the traditional fishermen's fishing area. This shows that conflicts occur due to violations of fishing lines that have been stipulated in Government Regulation of the Republic of Indonesia Number 11 of 2023 concerning

Measured Fishing in the fisheries management area of the Republic of Indonesia and the High Seas. In this PP-RI, the existence of fish fishing routes has been regulated, namely; Distance to sea for (a) Industry Quota: Awarded for water zones more than 12 nautical miles from the coastline or on the high seas. (b) Local Fisherman Quota: Awarded for water zones between 0–12 nautical miles from the coastline. It is devoted to supporting the activities of small and traditional fishermen. (c) Quota of Non-Commercial Activities: It usually applies to activities such as research, training, or hobbies (recreation), with no specific restrictions on the distance to the sea, but subject to licensing and supervision of local authorities.

2 Fisheries conflicts related to the type of fishing gear are 5 times in one year. In this case, the case that occurred was a drifting net that got stuck in the bottom net. Based on the Decree of the Minister of Marine Affairs and Fisheries Number 86 of 2021 concerning Fishing Gear and Fishing Aids in the State Fisheries Management Area of the Republic of Indonesia. (WPP-NRI). Therefore, the zoning provisions for certain fishing gear in each WPP-NRI must have an optimal operating location based on environmental conditions:

- Gill Net: Suitable for shallow to moderate waters, catching small pelagic fish such as tembang or lemuru.
- Purse Seine: Ideal for catching large pelagic fish in open waters (deep sea).
- Cantrang: Only allowed within certain limits, especially in areas with mud or sand substrates.
- Rawai: Suitable for demersal or tuna in offshore waters to the deep sea.

3 The traditional fishing area of OAP fishermen is used as a mooring location for semang ships 5 times a year. Based on the Regulation of the Minister of Transportation Number 125 of 2018 concerning the Implementation of Fishing Ports stipulates that ship mooring activities must be carried out in locations that have been designed or designated as fishing port areas. If mooring is carried out in other areas (such as beaches), special permission must be obtained and consider:

- Conformity with coastal spatial planning.
- Does not interfere with local fishermen's fishing activities.
- Waste management and prevention of ecosystem damage.

4. The scramble for fuel occurs every time fuel enters. This is because the number of subsidized fuel stocks is less than the

number of fuel aid recipients. Which results in jealousy for fishermen who do not get.

The occurrence of conflicts at the Fishing Base of Lamp Satu Beach Merauke is caused by vertical plurality. Vertical plurality, meaning a polarized social structure based on wealth, education, and power (Sidiq, 2019). Fishing boats that have a capacity of more than 15 GT have the power to operate at a longer distance from the fishing ground and cross the fshing ground of 5 GT ships, so it is very possible for 15 GT vessels to operate on fishing routes intended for vessels with a capacity of 5 GT – 10 GT. The purpose of the seizure of this fishery fishing line is to get economic benefits from fishery resources.

With the occurrence of conflicts at the Merauke one lamp beach, there are three classes of conflict resolution procedures, namely:

1. Joint decision-making procedure, which is a procedure in which decision-making is carried out by the parties involved in the conflict themselves (Sidiq, 2019). Its implementation can be done by socializing the Ministerial Regulation so that it can increase the knowledge and attitude of fishermen towards fishing routes. If fishermen have the knowledge and attitude to be able to follow the fishing route, it will be the basis for communication so that they can resolve conflicts based on the Joint Decision-making procedure.
2. Third party decision-making procedures, which are procedures where decision-making is carried out by parties who are not involved in the conflict (Sidiq, 2019). This can be done collaboratively by the Merauke Nusantara Fisheries Port, the Merauke Regency Fisheries Office, PSDKP Merauke, and Customary Institutions, as parties who are more aware of the regulations mandated by Government Regulation of the Republic of Indonesia Number 11 of 2023 concerning Measured Fishing in the fisheries management area of the Republic of Indonesia and the High Seas as well as unwritten customary regulations regarding customary areas.
3. Separate action procedures, which are procedures in which the parties involved in the conflict make decisions unilaterally or individually (Sidiq, 2019). This occurred in the conflict of encroachment Zone 0 – 12 nautical miles from the coastline which is intended for small and traditional fishermen where there is a customary area of the Marind tribe where the majority of fishing activities are carried out by the indigenous people of the Marind tribe. This unilateral action is carried out by means of reprimands that are carried out in stages starting from light reprimands to severe reprimands.

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Utilization of Local Knowledge

The indicator of the use of local knowledge in fish resource management is an indicator that provides an overview of the measures of the existence and effectiveness of local knowledge in fish resource management activities. The existence of local knowledge in fish resource management activities followed by its proper application is capital for sustainable management.

Local communities, especially the indigenous people of the marind tribe at the fishing base of Lamp One Merauke Beach, have local knowledge in the use of local knowledge in the management of fishery resources. Local knowledge of the community is related to fishing ground areas in customary areas and sustainable fishing. Based on the results of the interview, there is local knowledge in the management of fishery resources but it is not effective. This is caused by the diversity of tribal types in the fishing base area and the lack of socialization. The local knowledge contained in the fishing base of Merauke One Lamp Beach is:

1. The prohibition of fishing activities for 5 GT Up fishermen in the area of 0 - 4 miles from the coastline which is customary territory, this is related to the limitations of indigenous peoples who carry out fishing using only nets and boats without motors. So that if there is a seizure of the fishing zone, there will be unbalanced competition for fishing and has the potential to harm local fishermen.
2. It is not allowed to throw non-target catches on the coast, the discarded fish will rot and cause pollution in seawater and beaches so that it has the potential to become a source of disease for the marine ecosystem and humans.
3. Do not overcatch shrimp during the shrimp spawning season and do not catch shrimp seeds/fry. The local community realizes that if shrimp seeds are caught excessively, it will threaten the shrimp population will drop drastically and even be threatened with extinction.

Composite Analysis

The analysis using the Flag system shows that there is a varied distribution of values for each indicator in the analyzed social domain. The results of the analysis on the domain are described tabularly as follows:

Table 1. EAFM Social Domain Flag System Analysis

INDICATOR	CRITERION	SCORE	WEIGHT (%)	VALUE
Stakeholder participation	1 = < 50%;	1	40	0,4
	2 = 50-100%;			
	3 = 100 %			

Fisheries conflicts	1 = more than 5 times/year; 2 = 2-5 times/year; 3 = less than 2 times/year	1	35	0,35
Utilization of local knowledge in resource fish management (including TEK, traditional ecological knowledge)	1 = none; 2 = exists but is not effective; 3 = exist and effectively use	2	25	0,5
Total			100	**1,25**

Table 1 presents the results of the EAFM social domain assessment using the flag system, which integrates indicator scores, weighting factors, and index values to evaluate overall social performance. The flag colors (red, yellow, and green) represent poor, moderate, and good conditions, respectively, and provide a visual interpretation of the relative contribution of each indicator to the composite social domain index.

Table 2. EAFM Social Domain Flag System Analysis

Domain	Composite Value	Description
Social	1,25	Bad

Source: (Data Primer, 2024)

Total Score Criteria

1-1,6	Bad
1,7-2,5	Common
2,4-3	Good

Table 2 summarizes the composite index value of the social domain, derived from the weighted aggregation of all assessed indicators. This composite value reflects the overall status of the social dimension within the EAFM framework and serves as the basis for categorizing fisheries management performance into predefined criteria (poor, moderate, or good).

Repair Plan

The plan to improve fisheries management at the fishing base of Lamp One Merauke Beach can be seen in the following table 3 outlines the proposed management improvement plan, linking current indicator performance with targeted goals and corresponding intervention strategies to enhance the social domain of fisheries management.

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Table 3. Repair Plan

Purpose	Indicator	Current score		Goal Score		Management Improvement Plan
		Score	Criterion	score	Criterion	
Increasing Stakeholder Participation in Fisheries Management	Stakeholder Participation	1	Stakeholder engagement < 50%	2	Stakeholder engagement 50-100%;	1. Awareness of the urgency of fisheries management: a. Optimizing the role of Fisheries extension workers b. Collaboration with academics as one of the sources of information c. Empowering Innovators and motivators from the community d. Optimizing the role of media
						2. Projecting positive and negative impacts on fisheries management
						3. Providing communication media in fisheries management
						4. Increasing the Competence of Fishermen in Fisheries Management
						5. Expanding Networking
						6. Involvement of fishermen in every stage of fisheries management
Blurring the frequency of conflicts	Conflict	1	Occurs 20 times/year;	2	Occurs 2 – 5 times/year;	1. Joint decision making procedures ; Socialization of Government Regulation of the Republic of Indonesia Number 11 of 2023 and village regulations and Intensive humanist communication
						2. Decision-making procedures by third parties: Law Enforcement
Effective Utilization of Local Knowledge in Fish Resources Management	Utilization of local knowledge in fish resource management	2	exists but is not effective	3	exist and effectively use	Acceleration of Diffusion of Local Wisdom: a. Establishing humanistic relationships between immigrant fishermen and OAP fishermen b. Optimization of Customary Institutions c. Culture-based fishing village d. Optimizing the role of media

Source: (Data Primer, 2024)

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CONCLUSION

The activeness of stakeholders in managing fishery resources based on the social domain through the EAFM (Ecosystem Approach to Fisheries Management) approach, is in poor criteria and is given a red flag. In addition, fisheries conflicts in the management of fishery resources based on the social domain through the EAFM (Ecosystem Approach to Fisheries Management) approach, are in bad criteria and are given a red flag. The existence and effectiveness of the application of local knowledge in the management of fishery resources based on the social domain through the EAFM (Ecosystem Approach to Fisheries Management) approach, is at the medium criteria and is given a yellow flag and the social domain through the EAFM (Ecosystem Approach to Fisheries Management) approach, at the Fishing Base, the lighthouse is on the Poor criterion and is given a green flag.

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