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Analysis of the Role of Stakeholders in the Sustainability of Marine Capture Fisheries in Jember Regency

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Abstract The sustainability of marine capture fisheries is essential for economic development, social welfare, and environmental preservation, particularly in regions like Jember Regency, East Java. This study analyzes the role of various stakeholders in ensuring sustainable fisheries in this region. Key stakeholders include the Jember Regency Fisheries Service, Supervisory Com-munity Groups, Village Heads, Fishermen Groups, Fisheries Assistant, Non-Governmental Organizations, and Fishermen's Cooperative. Using the MACTOR method, this research identifies each stakeholder's influence and involvement. Results indicate that Jember Regency Fisheries Service, Supervisory Com-munity Groups, Village Heads, Fishermen Groups, Fisheries Assistant, Non-Governmental Organizations, and Fishermen's Cooperatives show lesser involvement. Key challenges include overfishing, ecosystem damage, and a lack of investment in fishing port infrastructure. The study highlights the importance of collaboration between all stakeholders to enhance the economic, social, and ecological sustainability of the fisheries sector in Jember. By aligning the efforts of both governmental and non-governmental actors, the fisheries sector in Jember can ensure long-term sustainability, increasing productivity and improving the welfare of the fishing community.

Keywords Marine Capture Fisheries, Sustainability, Stakeholder Analysis, MACTOR Method

1. Introduction

The area of waters in Indonesia is 6.4 million km with a coastline length of 108,000 km, 17,504 islands, and a population of 140 million people living in coastal areas (Kementerian Kelautan dan Perikanan, 2024). In the sea, there are marine resources that are divided into four groups, namely renewable resources, non-renewable resources, marine energy, and environmental services, where the potential of these marine resources is still not optimally managed (Tangke, 2023). The capture fisheries and aquaculture sectors are included in the category of marine resources that can be recovered, so they require the development of various aspects which can provide great contribution value in regional economic development (Kaison et al, 2021). According to Todaro (1997), economic development is a part of development that has meaning as a process involving major changes in social conditions, an attitude of getting used to something new, and the task of national institutions, as well as the acceleration of economic growth, poverty reduction or eradication (Hasan & Azis, 2018).

According to data from the Ministry of Maritime Affairs and Fisheries of the Republic of Indonesia, in 2023 East Java ranks second in the production volume of marine capture fisheries of 568,955 tons. Data from the Jember Regency Fisheries Office, states that Jember Regency is one of the regions in East Java that produces marine capture fisheries, which in 2023 will see an increase in production of 13,593 tons with skipjack fish, cob, shrimp, and other types of fish caught. There are 5 fish-catching sub-districts, namely Kencong, Gumukmas, Puger, Ambulu, and Tempurejo Districts. According to Muhartono and Nurlaili (2019), Jember Regency is an area that is a vital fish landing center with great potential in the fisheries sector, supported by abundant marine resources and developing marine product processing activities. Quoting from Radar Jember (2024), the Regent of Jember Regency is the only regional head in East Java Province to obtain the Satya Lencana Wira Karya in the field of fisheries, because of his innovation, and many other programs such as moving the ocean to the mainland.

The direction of catch management tends only to increase production without paying attention to the value-added aspect which will have an impact on the overexploitation of fish resources, therefore, management in the fisheries sector must be carried out in a sustainable manner in order to maintain the sustainability of fishery resources so that overfishing does not occur, and affects the increase of business productivity, increase income, and the welfare of actors in the fisheries sector (Imelda et al, 2019).

Sustainability is something important in fisheries development which is expected to improve resource conditions

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and the welfare of the fisheries community itself (Tuhuteru et al, 2015). According to Suharno et al (2020) Stakeholder involvement is very important in the sustainability of small-scale capture fisheries. The involvement of stakeholders can anticipate excessive utilization of fish resources and coupled with the destruction of ecosystems such as coral reefs.

According to Rahmayanti (2018), stated that currently there are still not many fishery companies investing in fishing ports, this is due to several factors including weak support for legal instruments, fish production capacity in the area around the port, incentives for local governments or area managers for investors who will invest in the area, as well as capacity on existing land. Meanwhile, according to Ramlah et al (2022), it is stated that the emergence of threats to the sustainability of fish resources and the capacity of business actors is still the main concern in realizing capture fisheries, because if there is excessive fishing, it will have an impact on fishermen's economic problems, in addition, there are problems with the level of education, lack of data recording, and lack of understanding related to the use of geographic position systems (GPS) when going to sea. This indicates that it requires the role and attention of all stakeholders so that fisheries sustainability and fishermen's welfare are achieved.

From this phenomenon, it is the background in researching the role of stakeholders in the sustainability of marine capture fisheries in Jember Regency. The role of stakeholders will be analyzed using MACTOR, which will identify the preferences of each stakeholder and the level of their role towards the goals that have been identified (Mafruhah et al, 2021). There are seven actors that will be analyzed, namely the Jember Regency Fisheries Service, Supervisory Community Groups, Village Heads, Fishermen Groups, Fisheries Assistant, Non-Governmental Organizations, and Fishermen's Cooperative.

2. Literature Review

2.1. Sustainable Development Concept

According to Todaro (1995), development must have several main objectives, namely increasing supplies and expanding equitable access to basic material needs, raising living standards including increasing income, providing adequate employment, better education, paying greater attention to cultural values and human values, increasing awareness of self-esteem both individually and nationally. and to expand the range of economic and social options for the whole society through liberation from dependency not only in relation to other people and other countries, but also from the sources of human ignorance and suffering (Afandi et al, 2023). Development is essentially a process of transforming society towards a state that is close to the goals of the aspired society as stated in the constitution, in which the process finds two things that need to be considered, namely sustainability and change (Yamin & Haryanto, 2017). Based on the United States Environmental Protection Agency (USEPA, 2013) Sustainable development has an approach to three pillars, namely trying to achieve equality of economic development, social welfare, and environmental preservation in a development system that is related to each other (Widuri, 2021).

2.2. Concession Stakeholder

According to Handayani and Warsono (2017), the definition of stakeholders is divided into 3 groups, namely:

1. Primary stakeholders are stakeholders who are directly affected, both positive and negative impacts of a plan and have a direct interest in the activity.
2. Key stakeholders, namely those who have legal authority in terms of decision-making.
3. Secondary stakeholders, namely stakeholders who do not have a direct interest in a plan but have a great concern for the development process.

Stakeholders are any individual or group that has an interest in, and involvement in a certain organization, where these stakeholders will influence and influence each other to achieve a goal (Gravitiani et al., 2022). Stakeholders in marine capture fisheries in Jember Regency are:

1. The Jember Regency Fisheries Service has a role in setting policies, supervising, and providing technical support for sustainable capture fisheries management.
2. The Supervisory Community Group plays a role in supervising fishery activities to ensure compliance with rules and the preservation of marine resources.
3. Village Heads have a role in facilitating communication and collaboration between fishermen, communities, and the government to support sustainable management of marine resources.
4. Fishermen groups play a role in carrying out marine capture fisheries activities responsibly and collaborating in the joint management of marine resources.
5. Fisheries Assistant plays a role in providing technical assistance and logistical support for fishermen to ensure the continuity of capture fisheries operations.
6. Non-Governmental Organizations (NGOs) play a role in providing education and advocacy about sustainable fisheries and fighting for the rights of fishermen.
7. Fishermen's Cooperative have a role to organize and support the welfare of fishermen through the provision of sustainable economic facilities, such as access to capital and markets.

2.3. Capture Fisheries Concept

National capture fisheries are still characterized as small-scale capture fisheries, which are synonymous with poverty and always lose competition with large ships in the use of fish resources (Kusdiantoro et al, 2019). According to (Berkes, Mahon & McConney, 2008) poor management of small-scale capture fisheries will result in conflicts so that they are not able to keep up with the speed of economic progress, population growth, food needs and poverty (Ikhsan

& Arkham, 2020). Capture fisheries are fishing activities carried out by humans in marine waters or public waters such as rivers, lakes, swamps, or coastal waters using capture fisheries methods that involve the use of fishing gear such as nets, fishing rods, nets, nets, bubu, and other fishing gear (Kurniawan, 2024). Marine capture fishery products provide approximately 54 percent of the total demand for animal protein sources consumed by people in Indonesia, therefore the great potential of capture fisheries is in line with the many requests from various countries, so that it is a great opportunity for business actors in the field of capture fisheries, both large-scale companies and traditional business actors, to improve the quality standards of handling and processing of catches in the sea that can meet the demand of the export market by adjusting the quality standards of each destination country (Munarko et al 2023).

3. Research Methodology

3.1. Research Design

This research design uses a quantitative descriptive analysis method. This method is used to analyze and test the role of stakeholders in the management of the small-scale marine capture fisheries sector, both Regional Government Institutions, Private Sector, and the community. The research was conducted in July - September 2024. The method of determining the location of the research was carried out purposively (intentionally). The area chosen as the object of research and sample is Jember Regency where Jember Regency is a producer of capture fisheries that has quite large potential as indicated by receiving an award from the East Java Provincial Government related to the sustainability program for capture fisheries and protection of fishermen in the form of fisherman insurance facilities.

In addition, Jember Regency is one of the regencies that has the potential for capture fisheries to be developed in order to have a greater impact/influence on the development of the Jember Regency area. Jember Regency has potential in terms of capture fisheries but still needs integration between stakeholders involved in the sustainability of fisheries in Jember Regency, so it is necessary to analyze the role of actors/stakeholders and factors related to the sustainability of fisheries in Jember Regency.

3.2. Data Collection Method

The sampling method in this study uses the Non-probability sampling type with the Purposive sampling technique. According to Sugiyono (2018) Non-probability sampling is a sampling technique that does not provide equal opportunities or chances to each member of the population when being selected as a sample. While the Purposive sampling technique according to Sugiyono (2018) is sampling using several specific considerations according to the desired criteria to be able to determine the number of samples to be studied.

Sampling in this study used the purposive sampling method or deliberate selection of respondents. The sample consisted of 93 respondents including the Fisheries Service, Community Supervisory Groups, Village Heads, Fishermen's Groups, Pengamba', Non-Governmental Organizations, Cooperatives. Sample selection was based on the role and synergy between actors and factors in implementing sustainable capture fisheries policies. In addition, the samples taken also have a full relationship to the sustainability of capture fisheries in Jember Regency.

The type of data used in this study is primary data that is descriptive quantitative in nature, namely data obtained from the Fisheries Service, Community Supervisory Groups, Village Heads, Fishermen's Groups, Fishermen, Non-Governmental Organizations, Cooperatives as stakeholders in the sustainability of capture fisheries using structured questionnaires, while secondary data uses published data from the Fisheries Service of Jember Regency and previous research results.

The problem is investigated through focus group discussions (FGD). The results of the FGD are used as analysis material with a factor and actor (stakeholder) approach using a prospective structural analysis (PSA) tool using Mactor software. Furthermore, the results of the analysis are used as a reference for formulating a sustainable capture fisheries policy plan that will be proposed.

3.3. Data Analysis Methods

The data analysis method used to analyze and test the role of stakeholders in the management of the small-scale marine capture fisheries sector uses prospective structural analysis (PSA) with Mactor software. The use of the Prospective Structural Analysis (PSA) method with Mactor software in this study is to observe the relationship and influence between variables that allow the classification of variables to understand the most relevant variables for the sustainability of capture fisheries. Prospective structural analysis (PSA) with Mactor software is a comprehensive analysis in mapping the synergy between actors and factors in implementing sustainable capture fisheries policies compared to other analyzes.

The use of Prospective Structural Analysis (PSA) with mactor software has been widely used to conduct sustainability-related analysis. Several studies on the use of Prospective Structural Analysis (PSA) with mactor software include: Ahmed, Saleh, Abdellkadir, Abdelrahim (2009) conducted a sustainability analysis of desert areas in Egypt. Jaziri & Bousafa (2010) conducted a sustainability analysis of tourism in Tunisia, while Raju, Delaere, Lindmark, Stamatelatos & Ballon (2011) conducted a sustainability analysis of business in energy networks. Fauzi, (2019) used the Prospective Structural Analysis (PSA) method with mactor software to conduct a policy analysis on the prohibition of Cantrang fishing gear.

Prospective analysis is used to rank the positions of stakeholders on many strategic issues, assess convergence and divergence, and anticipate coalitions and conflicts (Omran, Khoris & Saleh, 2014). The prospective analysis

method with Mactor software conducts a comprehensive analysis of the strategies and initiatives of actors. Mactor (Alliance and Conflict Matrix: Tactics, Objectives and Recommendations) is based on the influence between actors. The Mactor method attempts to provide a global picture of the importance and possible outcomes of various issues, as well as the expected actor strategies, power relationships and potential alliances and conflicts. This method is intended to obtain the possibility of the evolution of the system being studied to build better and more coherent scenarios (Fauzi, 2019).

The stages in prospective structural analysis (PSA) with Mactor software (Fauzi, 2019) include: (i). identification related to the topic to be analyzed; (ii) conducting Focus Group Discussion (FGD) with key informants consisting of the main actors (fishermen groups, Village Heads, Cooperative Fishermen, NGOs) and representatives from the Jember Regency Fisheries Service and Community Monitoring Groups by conducting structured interviews to collect data. (iii) identifying the actors involved and the objectives to be achieved. After these stages are carried out, the tables for analysis are filled in (Matrix of Direct Influence/MDI Table and Actor-Objective/2MAO Table).

Actors involved in prospective structural analysis (PSA) using Mactor software, namely;

1. Fisheries Service
2. Community Supervisory Group
3. Village Head
4. Fishermen Group
5. Fisheries Assistant
6. Non-Governmental Organization
7. Fishermen's Cooperative

Meanwhile, the objectives set in prospective structural analysis (PSA) using Mactor software are:

1. Sustainability of the Economic Dimension
2. Sustainability of the Social Dimension
3. Sustainability of the Environmental/Ecological Dimension

4. Results and Discussion

The initial stage in the prospective structural analysis (PSA) analysis using Mactor software is to build a direct influence matrix or MDI (Matrix of Direct Influence) and MAO (Matrix of Actor Objective). The MDI matrix describes the influence between actors on other actors which is indicated by a score of 0 to 4, the greater the value indicates the greater the influence, while the MAO matrix shows the actor's attitude towards the objective.

Table 1. MDI (Direct Influence Matrix Between Actors) shows the level of influence of each actor on other actors. For example, the Fisheries Service has a large influence on the Community Monitoring Group and the Fishermen Group. This is in accordance with the strategic role of the Fisheries Service as a policy distributor. In contrast, other actors such as Pengamba', Non-Governmental Organizations and Cooperatives do not have significant influence on other actors. The relationship between actors is measured by a scale that shows the level of influence, where the Fisheries Service acts as the main authority in the region. Meanwhile, other actors such as Non-Governmental Organizations and Cooperatives show lower influence.

Table 1. MDI: Analysis of Direct Influence Between Actors

MDI	Jember Regency Fisheries Service	Supervisory Community Group	Village Heads	Fishermen groups	Fisheries Assistant	Non-Governmental Organizations (NGOs)	Fishermen's Cooperative
Jember Regency Fisheries Service	0	4	3	4	2	2	2
Supervisory Community Group	4	0	3	3	2	2	1
Village Heads	3	3	0	3	2	2	2
Fishermen groups	3	3	2	0	3	2	2
Fisheries Assistant	2	2	2	3	0	2	3
Non-Governmental Organizations (NGOs)	2	2	2	2	2	0	2
Fishermen's Cooperative	2	2	2	3	0	2	0

Source: Processed Primary Data (2024)

The importance of collaboration between low and high-power actors in the context of fisheries sustainability policy, as well as approaches to increase the involvement of stakeholders with lower power, such as Non-Governmental Organizations (NGOs) and cooperatives. High-Power Actors (such as Fisheries Offices and Village Heads) often have better resources and access to information. Collaboration with Low-Power Actors (such as NGOs and Cooperatives) can create balance in decision-making, ensuring that the voices of all stakeholders are heard. Fisheries Offices can provide relevant data and information, while NGOs can provide local perspectives on the impacts of the policy. The findings of Bell & Reed's (2022) research emphasize that inclusive participation in decision-making increases the legitimacy and sustainability of policies.

Collaboration can generate innovative ideas and solutions. Low-leverage actors, such as NGOs, often have valuable local knowledge and can offer new perspectives that are not available at higher policy levels. Samia et al. (2019) show that innovation in natural resource management often emerges from collaboration between actors with local experience and more formal policy actors.

The 2MAO matrix (Table 2) is a matrix of the relationship between stakeholders and the objectives to be achieved. Table 2 illustrates the relationship between actors and the objectives of the capture fisheries sustainability program in Jember Regency. Positive and larger values indicate that the actors agree with the program objectives. The Fisheries Service, Community Monitoring Groups, and Fishermen's Groups showed strong support for economic, social, and ecological sustainability, with the highest achievement values. Meanwhile, Non-Governmental Organizations and Cooperatives showed lower values, indicating that the program had not been fully successful from their perspective.

Table 2. 2MAO: Actors' Attitudes Towards Capture Fisheries Sustainability Objectives

2MAO	DE	DS	DE
Jember Regency Fisheries Service	4	4	4
Supervisory Community Group	4	4	4
Village Heads	2	3	2
Fishermen groups	4	4	4
Fisheries Assistant	4	3	3
Non-Governmental Organizations (NGOs)	2	2	2
Fishermen's Cooperative	2	3	2

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Source: Processed Primary Data (2024)

When low-power actors are involved in decision-making, this increases accountability for high-power actors. NGOs can act as independent monitors to ensure that policies are implemented in accordance with sustainability principles. Niekerk. (2020) suggest that greater accountability in resource management can be achieved through broader community participation, including stakeholders with less power.

Duarte (2020) emphasized that fisheries sustainability can only be achieved if economic, social, and environmental dimensions are considered simultaneously. Therefore, synergy between actors is needed so that all dimensions of sustainability can continue to run in balance.

Table 3. Level of Direct and Indirect Influence and Dependence

MDII	Jember Regency Fisheries Service	Supervisory Community Group	Village Heads	Fishermen groups	Fisheries Assistant	Non-Governmental Organizations (NGOs)	Fishermen's Cooperative	li
Jember Regency Fisheries Service	16	16	14	16	12	12	11	81
Supervisory Community Group	15	15	13	15	12	11	11	77
Village Heads	15	15	14	15	12	12	11	80
Fishermen groups	14	14	14	15	12	12	12	78
Fisheries Assistant	13	13	12	14	12	12	12	76
Non-Governmental Organizations (NGOs)	12	12	12	12	11	12	11	70
Fishermen's Cooperative	12	12	11	12	12	11	10	70
Di	81	82	76	84	71	70	68	532

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Source: Processed Primary Data (2024)

Table 3 shows the net direct and indirect influence (Li), while (Di) shows the degree of net direct and indirect dependence. The Fisheries Service is the actor with the greatest influence (li=81), while the KPR has the greatest dependence (Di=68). This shows that the Fisheries Service is the main driver in the sustainability of capture fisheries, while the KPR is highly dependent on the actions of other actors.

The Fisheries Service is the main actor in the sustainability management system of small-scale capture fisheries in Jember Regency. The Fisheries Service has a key role in the sustainability of capture fisheries through programs run by the Community Supervisory Group with supervision of the use of fishing gear. Therefore, the Fisheries Service and the Community Supervisory Group have a strong influence and relatively low dependence compared to other actors.

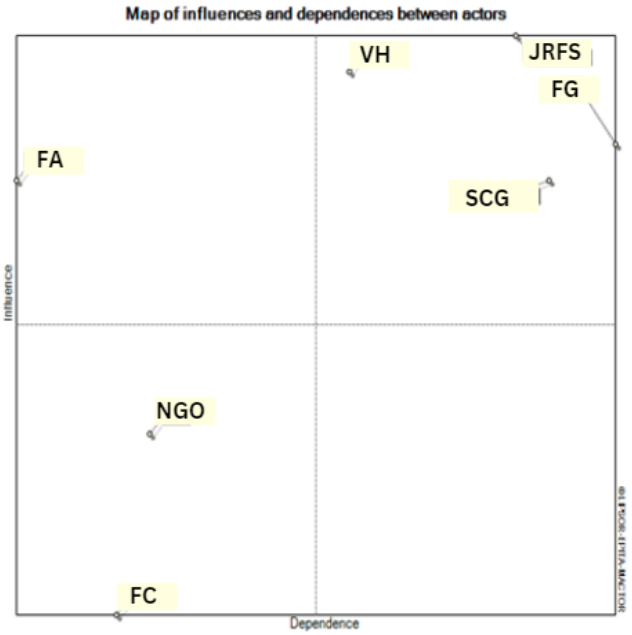

Figure 1. Mapping of Actor Roles in Quadrants: Level of In fluence with Level of Dependence (***Source:*** *Processed Primary Data (2024)*)

The strength of influence and level of dependence of each actor/performer can be described according to their location in the quadrant (Figure 1). Actors/performers (stakeholders) play an important role in determining the sustainability of a program or system. Actors in the influence and dependence map help in understanding how interactions between actors achieve goals and how to mobilize actors to achieve goals (Fauzi, 2019).

Figure 1 shows the power of influence and dependence of actors in the sustainability of small-scale capture fisheries. The higher the actor has a higher influence, while the further to the right the actor has a high dependence (Fauzi, 2019).

Figure 1 shows the role map of each actor, the Pengamba' actors are actors who have a high role/influence and have low dependency (located in quadrant I/Top Left). While the actors located in quadrant II are actors who have high influence and dependency including the Fisheries Service, Village Head, Fishermen Group and Community Supervisory Group. In quadrant IV (bottom left) namely Non-Governmental Organizations and cooperatives are actors who have little influence and very little dependency.

Collaboration between high and low-influence actors can strengthen social networks, which are essential for building support for sustainability policies. Strong networks enable stakeholders to collaborate more effectively. Siregar et al (2019) states that strong networks between actors can increase the capacity to adapt and act in the face of environmental challenges.

Figure 2 is a visualization of the convergence network and its convergence values. The red line shows the level of convergence between actors. Lines of different colors and different thicknesses show differences in the level of convergence between actors. The convergence between the Fisheries Service, Fishermen's Groups and Community

Supervisory Groups shows the highest value, indicating the closeness/strong level of convergence between the actors. These three actors have the most roles in terms of policy makers and implementers of sustainable capture fisheries goals. Meanwhile, the blue line with a strong convergence thickness shows differences in convergence between actors, namely Fishermen's Groups, Fishermen's Groups, Community Supervisory Groups, and the Fisheries Service. A more moderate relationship occurs between other actors such as Village Heads, NGOs, and KPR. This indicates that some actors work more closely in implementing sustainability programs than other actors.

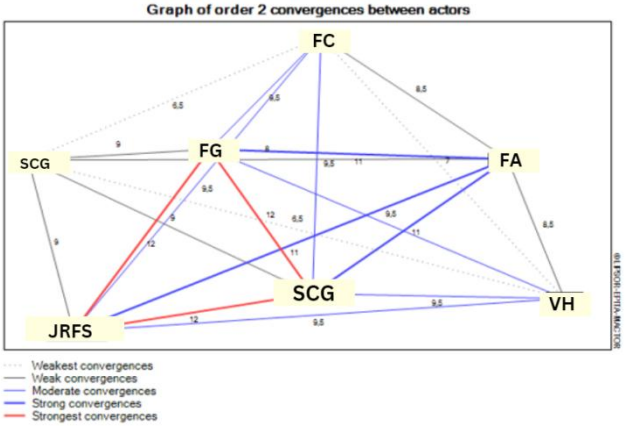

Figure 2. Image of Convergence Between Actors (***Source:*** *Processed Primary Data (2024)*)

As a government agency responsible for policy-making, DisPerikan has a major influence on fisheries policy and marine resource sustainability. Strong relationships with other actors enable DisPerikan to coordinate programs and initiatives that support sustainability. Engagement Strategy Develop training programs for fishermen groups and PokMasWas so that they understand policies and best practices in resource management. Establish more active communication with all actors to strengthen cooperation in policy implementation.

Figure 3 presents the results of the Prospective Structural Analysis (PSA) using Mactor software that performs "scales" for each objective. There are 3 objectives included in the stakeholder analysis of capture fisheries sustainability, including economic, social, and environmental dimensions. The objectives of the stakeholder analysis of capture fisheries sustainability from an economic perspective have objectives that have the same direction (all showing a + (positive) scale direction, which means supporting the objectives. Sustainability of capture fisheries has a positive impact on the local economy. Research by Hamelin et al. (2024) emphasizes that sustainability in the fisheries sector contributes to increased income and food security. The results in Jember Regency are in line with these findings, where sustainability programs increase fishermen's catches and incomes, which in turn improve their quality of life. Furthermore, Zondervan & Zondervan (2022) show that sustainable resource management can increase fishermen's competitiveness by reducing operational costs and increasing yields. The results of the analysis in Jember Regency show that fishermen feel an increase in profits, which emphasizes the importance of implementing sustainable fisheries practices.

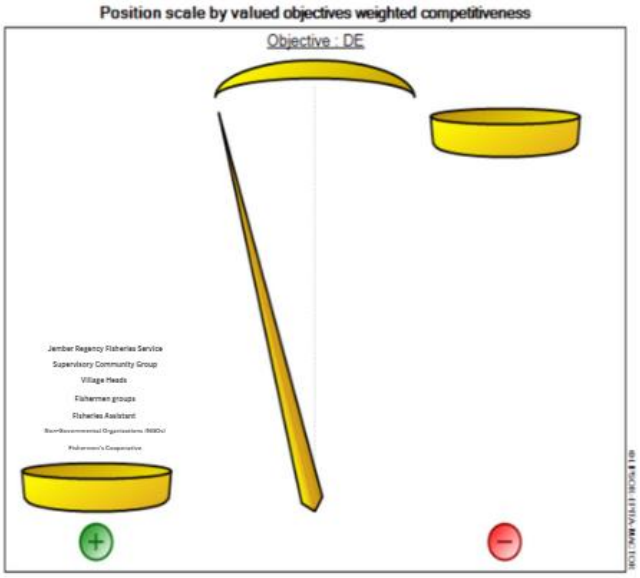

Figure 3. MDII Competitiveness Scale – Objective: Sustaiability of Economic Dimension (***Source:*** *Processed Primary Data (2024)*)

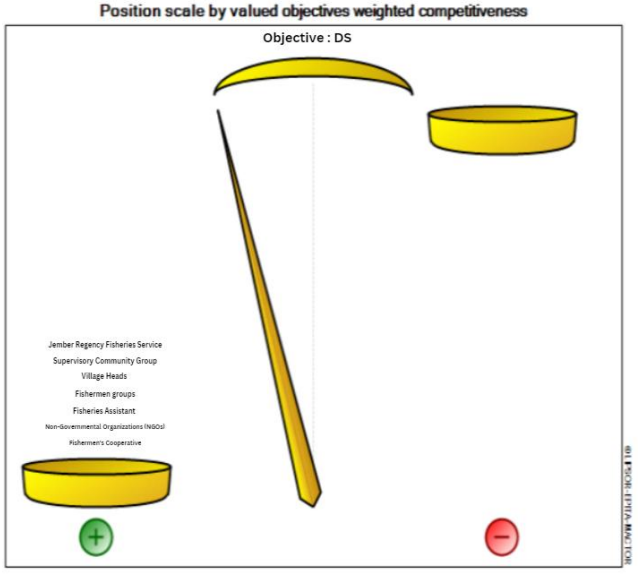

Figure 4. MDII Competitiveness Scale – Objective: Sustaiability of Social Dimension (***Source:*** *Processed Primary Data (2024)*)

Figure 4 shows the "scales" against the objectives of social sustainability. Similar to the economic sustainability program, the figure shows that the "scales" are pointing to the left of the positive symbol (+). This means that all actors stated that the social sustainability program was carried out in accordance with the objectives and received positive results or responses.

The social aspect of fisheries sustainability includes increasing community participation in decision-making. According to Samia et al. (2019), the success of fisheries management is highly dependent on the involvement of local communities. In Jember Regency, increased cooperation

between fishermen and government institutions can be seen in programs that involve the community.

The data shows that actors in the fishing community are increasingly active in the management process, which creates a sense of ownership of resources. This is in line with research by Echeverri et al. (2018) which highlights the importance of local participation in achieving sustainability.

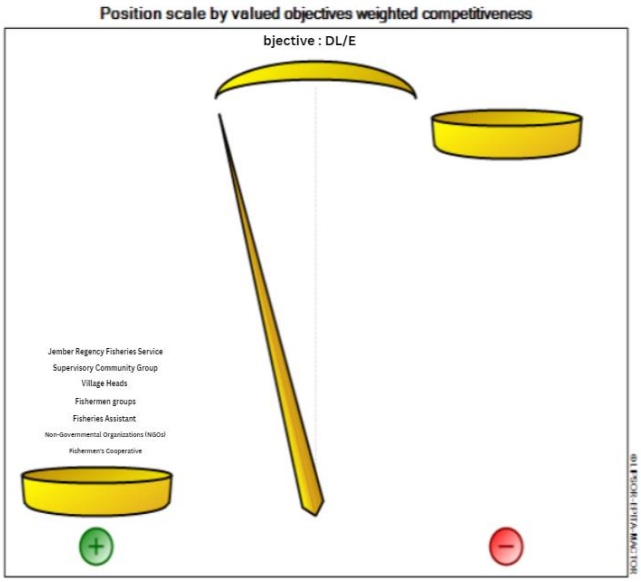

Figure 5. MDII Competitiveness Scale – Objective Sustaiability of Ecologi Dimension (***Source:*** *Processed Primary Data (2024)*)

Figure 5 shows the "scales" against the main objective of capture fisheries, namely environmental sustainability. Similar to the sustainability program in the environmental/ecological dimension, the figure shows that the "scales" are pointing to the left of the positive symbol (+). This means that all actors state that the sustainability program has been carried out in accordance with the objectives and has received positive results or responses.

From an environmental perspective, the sustainability of capture fisheries contributes to the preservation of marine ecosystems. Research by Gilson et al. (2021) shows that sustainable management can help maintain biodiversity and ecosystem health. In Jember Regency, awareness of the need to protect marine habitats is increasing, and actors are involved in conservation efforts. However, challenges still exist, including destructive fishing practices and pollution. Therefore, a more holistic approach is needed to address this environmental problem. Berkes et al. (2018) recommend strengthening regulations and education programs to raise awareness of the importance of sustainability in fisheries resource management.

5. Conclusions

The sustainability of marine capture fisheries in Jember Regency is heavily influenced by the active role of various stakeholders, including government institutions, fishermen groups, and NGOs. The study indicates that key actors, such as the Jember Fisheries Service and Community Supervisory Groups, play a pivotal role in maintaining sustainable fisheries practices, while other stakeholders, such as cooperatives and NGOs, need further involvement. Effective collaboration is essential for managing fishery resources, as overfishing and environmental degradation pose significant risks. The implementation of sustainability strategies has led to improved economic outcomes for local fishermen, yet challenges such as lack of infrastructure investment and education for fishermen remain. Involving all actors in a balanced way can ensure that fisheries not only provide economic benefits but also contribute to social and ecological well-being.

6. Policy Recommendations

Strengthening stakeholder collaboration through a multi-stakeholder approach should be promoted by strengthening partnerships between stakeholders. This can be done by holding regular coordination meetings to align sustainability goals and strategies. Develop infrastructure by encouraging public and private sector investment in fishing port infrastructure. The provision of better facilities will not only support large-scale fishery operations but also improve the quality and handling of fish products. Supporting education and technology such as providing training programs for fishermen that focus on sustainable practices, modern fishing techniques, and the use of GPS for navigation. This will increase the sustainability and economic competitiveness of small-scale fisheries. Regulation and oversight by strengthening regulatory frameworks to prevent overfishing and ensure compliance with sustainability measures. Regular oversight by the supervisory group must be supported with modern technology to improve resource management. Encourage economic incentives through the development of incentive schemes for sustainable fisheries practices, including subsidies for environmentally friendly fishing gear and access to markets for sustainably sourced products. This will help ensure that sustainable fisheries remain economically viable. By implementing these policies, the marine capture fisheries sector in Jember can achieve long-term sustainability that benefits both the local economy and the environment.

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