

Fostering Community Engagement towards Sustainability in Small-Scale Fisheries

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Abstract. The purpose of this paper is to explore the concept of community engagement in supporting sustainability in the context of small-scale fisheries in maritime sector. This paper qualitatively analyzes the opinions of selected fishermen to voice their community engagement in supporting sustainable fishing efforts. The main issues are illustrated using qualitative study-based data from a focus group discussion and interviews with fishermen who understand the rules and regulations. Evidence shows that the sea is positioned as a common-pool-resources. The community engagement in utilizing the sea raises awareness and volunteerism to work together to create value. This paper concludes that the role of maritime stakeholders of the village in providing their effort has been quite effective in engaging villagers in simple community activities, such as consulting with them on various issues to empowering community capacity to support fisheries sustainability. This paper expresses the opinions of key stakeholders in coastal villages about community engagement activities that provide benefits for policymakers, practitioners, researchers, and students who pursue sustainability in the context of small-scale fisheries in maritime sector.

1 Introduction

Indonesia is a country with more than 16.000 islands, and almost 75% of the total area is sea waters [1]. These facts make Indonesia, a country with approximately 108,000 km of coastline, the second-longest in the world after Canada [2]. Therefore, most of the population naturally lives along the coastline, spread over 3,216 locations, and are small-scale fishermen, whose existence dominates around 85% of Indonesia's fisheries activities.

Small-scale fishermen's lives depend on the marine resources around the coastline that become their livelihood source. Their activities are only limited around the coastline with an operation time of no more than one day [3]. Meanwhile, as the sea waters around the coast are an open area, anyone can explore it and have the possibility to exploit the resources contained in it. Research on common-pool resources, open access in the public domain and available for use by anyone, has said that although public use can reduce the shared benefits, applying exceptions for certain people is still difficult to be realized [4, 6]. Furthermore, the worst thing that can happen is the failure to maintain resources' sustainability [7]. In short, resources that are common, free, and have open access, such as the ocean, can be degraded [8, 9]. It can happen because seas have limitations in the availabilities and potential contains. Thus, suppose various parties are interested in utilizing these natural resources, they will likely become potential problems to the sustainability of the ecosystem and to the livelihoods of the surrounding fishermen. The notion of sustainability that must fulfil three elements;

people, profit, and planet [10]. It can be concluded if the ecological element (planet) is fulfilled, then the social element (people) where the fishermen and their empowerment in pursue their profession in wellness will automatically be fulfilled, and economic element (profit), market and industry conditions in the fisheries sector, then will remain sustainable.

2 Literature review

2.1 Sustainability in triple bottom line

The concept of Triple Bottom Line (TBL) implements management to operationalize an organization's responsibilities by returning what has been given by the community as a social system that acts as the owner of natural resources in the form of an economy. In practice, the concept makes a cycle where the return of resource management responsibilities is in the form of economic results (profit) is given back to the environment (planet) and human life (people) in a balanced manner.

The TBL also applies in the fisheries sector, where the sea as common-pool resources that provide various human life needs and acts as the manager. Although marine biota is a renewable resource, the sea is not overloaded if left hindered because of its natural ecosystem balance. Nevertheless, no fish breed means no fish, so that the fishery's sustainability becomes dependent [11, 12]. According to the perspective of ecological stock resilience, the concept of fisheries' sustainability is that ecological restoration can happen simultaneously with the extraction of marine resources

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for human food, while the harmony between communities, government institutions, and the fishing industry is still well-maintained [13]. Meanwhile, according to, capture fisheries can be equated with hunting, as it can lead to a species' extinction [12]. Thus, sustainable fisheries will be greatly influenced by the condition of fish stocks. Therefore, stock management is needed with a sustainable strategy by considering the stock growth rate compared to the rate of investment return, the sensitivity of each fish unit's capture costs, the size of fish stocks, and whether fish stocks have values beyond their consumption value or not.

Another opinion states that sustainable fisheries require a broader perspective [14]. Sustainable fishing is too narrow as it only focuses on resources and technical problems in fisheries. Sustainable fishing must bring thoughts on more fundamental issues. As the main managers of fisheries resources and collaborative management among parties, small-scale fishermen should be involved in the fisheries sector. Sustainable fishing includes a sustainable social-ecological system, which requires not only sustainable resource stocks but also profitable businesses in the harvest and post-harvest parts, also the communities that are willing to accept and support these industries along with those who involved in it [15-17]. The world's leading fisheries organizations are managing, developing, integrating aspects of the economy, society, and health of fish stocks in guiding principles that support the Triple Bottom Line concept [18, 19]. Thus, the three dimensions as performance indicators can recognize the continuity of fish stocks, the fishing industry, and if the fishing community is interrelated, mutually beneficial, and interdependent [20].

2.2 Community engagement

Community engagement is the process of working collaboratively with and through groups of people affiliated with geographical proximity, special interests, or similar situations to overcome problems that affect those people's well-being [21]. Community engagement is often described as a series of gradual changes, ranging from low-level engagement such as informing and consulting, to high-level strategy such as empowerment [22-25].

A good community can articulate goals designed to encourage community engagement by giving more opinions to local communities to carry out their local services by informing, consulting, involving, and giving back to local communities [26]. Engagement between the community and its citizens is needed to overcome disconnection, cynicism, and distrust of the community, so that it can encourage better policy development and service delivery [27, 28] or expand and improve the activeness of its citizens [29, 30]. The need to increase community engagement also aims to increase democratic accountability, improve community welfare, and issue more equitable and effective decision-making [31, 32].

3 Methodology

The study was conducted in a fishing village named Betahwalang, located on the northern coast of Central Java Province in Java Island, Indonesia. There were approximately 1,805 small-scale fishermen with 835 boats weighed between 3 to 5 gross weight ton (GWT) to catch the blue swimmer crabs (*Portunus Armatus*). These blue swimmer crabs (BSC) are among Indonesia's main marine export commodities with 397 million USD in value per year out of 4 billion USD other Indonesia's marine products commodities [33]. Indonesian BSCs are mainly exported to the United States of America and European countries.

After finding out the importance of BSC's impact on the livelihood of the small-scale fishermen, this paper seeks to analyze the opinions of selected fishermen, community leaders, and fishmongers at BSC communities to voice their engagement in supporting sustainable blue swimmer crab fisheries in Indonesia.

The study used Focus Group Discussions (FGDs) and in-depth interviews as the data collection method. The Focus Group Discussion was conducted during the project evaluation on implementing the Vessel Monitoring System (VMS) in small-scale fishing for BSC sustainability. Various stakeholders attended the FGDs, from the fishermen to exporters representatives. There were 60 BSC small-scale fishermen, 14 fishmongers, the head of the village as the community leader, VMS vendors, representatives of the local Government on behalf of the Central Java's governor, and representatives of the Indonesian Ministry of Marine Affairs and Fisheries. The FGDs were conducted in both Bahasa Indonesia and Javanese Language. A translator was provided during the FGDs to translate those who only speak in Javanese language.

Indonesia is well-known for its ethnic group varieties. More than 633 known ethnic groups in Indonesia have their own mother tongue languages and cultures. The fishermen in Betahwalang Village were mostly speaking in Javanese language as their mother tongue, rather than using Bahasa Indonesia that is their national language. The Javanese language is regarded as a common language within their community. This language barrier created language barrier issues in conducting the interviews. Thus, to eliminates this barrier, only a few eligible fishermen, including Mr. Noer Alimin, Mr. Khoirul Umam as the community leader, and the fishmongers who can speak in Bahasa Indonesia were selected. The interviews were conducted at the BSC landing station, or they called it "angkruk", which is located a few miles from the coast of Betahwallang Village. The interviewee's selection was taken into consideration to reduce the communication gap between the researchers and the interviewees.

With the main focus on the three pillars of sustainability, which are social, economy, ecology, the discussion considers the community engagement in BSC fishing activities. The main issues are illustrated using data from qualitative Focus Group Discussions (FGDs) and in-depth-interviews with fishermen who understand the rules and regulations. Therefore, only a few fishermen whose opinions can be analyzed. The

participants in the FGDs and in-depth interviews were voluntarily joined. Semi-structured interviews were conducted and covered various related key issues related to the research questions used in FGDs and in-depth interviews [34].

All conversations in the FGDs and in-depth interviews were recorded and transcribed verbatim into Bahasa Indonesia. Then, the transcription was re-examined with the recording. In-depth interviews and FGDs data were combined for data completeness and confirmation [35]. Thus, ensuring the integration of FGDs and in-depth interviews data, re-readings were carried out between data sets to find data convergence, divergence, and complementarity [35]. Thematic analysis was used to identify, analyze, and report the current study's patterns (themes) [36]. Pre-determined themes were formed from the main research questions, which had an impact on the overall activities. Data from FGDs and interviews were combined, transcripts were read in detail, and broad themes were recorded. An in-depth analysis was then carried out using a constant comparison process, where differences and similarities were analyzed to identify themes.

4 Result

Sustainability is the ability of the earth's biological system to sustain and k productive continuously. The earth must maintain the effects of man-made creations and their emissions, thus being able to regenerate itself and let living creatures on earth survive longer. The use of resources that meet human needs must be carried out simultaneously with environmental preservation to ensure that the current and future generations can access the resources.

The research was conducted due to the suspicion of potential threats to the blue swimmer crab fisheries business's sustainability from over-exploitation of the limited resources in the wild. Fishing is categorized as a hunting industry category [13] and is an unsustainable industry. In the FGDs between blue swimmer crab fishermen, traders, and processors, various findings were found related to the blue swimmer crab's sustainability and the ecosystem's carrying capacity, empowerment, and social interaction between fishermen and its supply chain industries. Statement about the reduction in blue swimmer crab catches revealed by a fisherman as follows:

"We fishermen feel happy if the price of blue swimmer crab continues to rise. However, we are also aware that if we continue to fish them without regard to regulations and restrictions, then slowly but sure, one day, the blue swimmer crab will be extinct. Actually, what we are feeling now, catching a kilo is fair enough, and we do not even take the small ones and the laying eggs."

This statement shows that their catches were still small despite trying to practice sustainable fishing. The condition supports the opinion that fishermen's daily needs and life demand to carry out intensive fishing, but with a large number, it can reduce the carrying capacity of resources and cause ecological disturbances [13, 37].

The threat to the preservation of crab resources is also related to the use of fishing gear, as revealed by other fishermen as follows:

"In the past, it was very easy to get blue swimmer crabs, with traps we used to catch 3 to 4 kilos every day. I think there are more and more competitors now, and surprisingly they use fishing gear that is not environment friendly. Accordingly, after the presence of Sodo (a type of fishing gear), our catches lessen."

"Here, the fishermen in our village use environment-friendly fishing gears. What about other villagers? We have been thinking about that question for a long time. If we use environmentally friendly fishing gear and catch small crabs and the crabs' laying eggs, but others do not, it will be useless."

The sea as common-pool resources (CPR) or shared resources [38], the tolerance and reciprocity among fishermen [39] can arise by itself from awareness of sharing [40, 41]. It is reinforced by the statement of a fisherman as follows:

"We are aware that the sea is public property. Therefore, as sailors, we really help each other. Because when we sail, the sea does not belong to these villagers alone. There are other villagers' rights too. However, when catching fish, we cannot see clearly what they are doing."

The sea, as common-pool resources or shared resources, open access will increase the number of fishermen in the fishing area. This open access will lead to the shared resource exploitation [7, 42]. The more parties exploit the sea, in a consumptive sense, then participation occurs in the activities of value co-creation in a sharing system so that rules are needed based on trust and reciprocity [43].

Togetherness in an engagement to realize sustainability occurred among traders and fishermen. It is indicated by the statement of a trader as follows:

"As a trader, I complained about you, fishermen, who were carelessly fishing. I was forced to buy small crabs, laying eggs, and other inappropriate types. This should not happen again. Prosperity cannot be only from traders. How to prosper together should be considered, as people say."

The statement supports the notion of engagement between fishermen and traders. Meanwhile, another trader stated that the traders should pioneer a strong engagement:

"I am a trader, inviting fellow traders, let's unite. As long as the traders are in unity, fishermen will follow the traders. Only if the traders are in unity, and hopefully, they are tightly bonded. Therefore, I ask the traders to strengthen engagements so that the sustainability of the crabs in this village can be realized."

The statement above emphasizes the importance of the traders' involvement as important actors in realizing the sustainability of crab fisheries. Hence, without actors' involvement, the integration of resources is difficult to obtain, neither value can be co-created. However, while value creation is difficult to observe empirically, actor engagement and related resource integration can be observed and more likely to be designed and managed [44].

Community engagement was revealed from several statements in the discussion forum, such as efforts to scale up their village to a national level, uniformity in using sustainable fishing equipment, and a common desire to create values capable of realizing sustainability. Regarding implementation and sustainability, resource balance challenges show that the real-world needs efforts that strengthen the means to sustainability. The fishing community is faced with competing demands and unrealistic business conditions. Community capacity and readiness to organize themselves for mutually beneficial actions are important issues to be assessed and considered in creating values from engagement to sustainability. Therefore, by obtaining the stakeholder perspective in the blue swimmer crab supply chain, the community's efforts to increase income by participating in supporting sustainability are important among fishermen's community life.

Materializing sustainability in fishing communities plays an important role in the TBL. Humans are believed to be controlling life at the top of the list [45]. Therefore, community engagement measurement is required and shall be conducted through a series of gradual changes [22-25]. First is starting from a low level of engagement, namely, the informational level. At the informational level, communication flows from one entity to another at the same level, affordable, and side by side. The same set of goals and targets were identified among the actors. Then these goals are translated into specific and tangible actions that bring measurable benefits to the community. The main objective is to incorporate local knowledge into the decision-making process from identifying community needs. Its output will lead to better design, targets, and a sense of ownership among stakeholders [46].

The second is the consultation. One entity shares information with the flow of communication from the entity to the community and then returns to find answers. The information obtained is community feedback, making it useful to develop connections. To that end, building trust between communities is a necessary process that is also sustainable. Maintaining a fair partnership is often tricky [47]. Responsibility cannot be taken for granted without maintaining communication throughout the collaborative process. Building relationships between and within a structured community is very important because relationships can develop into lasting partnerships that lead to more intensive collaborations [48].

Involvement is the third level that requires active participation in cooperation between entities based on trust. Involvement requires intense two-way communication on increasing collaboration aimed at partnerships [49]. Engagement of stakeholders in community-based activities requires substantial time and effort [50, 51]. Stakeholders in small-scale fishing communities face competing demands from unrealistic business conditions [52]. Therefore, stakeholders expect to devote all of their time and efforts to realizing overall sustainability in the Triple Bottom Line frame. It is shown by the importance of flexible and alternative

methods for involving the community in making important decisions for current and future lives.

The fourth level is empowerment. The last sequence is that each entity has formed a strong partnership structure made of a strong two-way relationship. Strongly built trust can make a decision-making process at the community level itself. Community engagement at the level of empowerment can also solve their own problem independently and influence the broader community [53]. The biggest challenge at this level is the funds [54]. Communities often lack resources, especially finance, that creating barriers to participate in community activities. It has the potential to create tension and pressure within and between the community itself. The qualitative results revealed the importance of engagement among stakeholders. Stakeholder engagement can secure funds to ensure self-sufficiency occurs. Stakeholder engagement can also integrate an outsider's intervention into the community. Interventions in the form of policy changes are usually difficult and will cause new problems.

One limitation that generally occurs with qualitative research is the relatively small number of participants representing. Therefore, the extent to which the findings can be applied outside the groups involved in the FGD and in-depth interviews require further research. This research was conducted in a village that potentially can become the main focus of the development because of the harmony and cooperation between the fishing communities, according to provincial-level local Government data. Given the existence of 34 provincial-level Governments and the diversity of thousands of ethnic groups in Indonesia, the answer to the question of whether this experience can be generalized is still uncertain. However, this study's results increase the population sample's understanding and help improve problem-solving that can be a consideration for other community-based research. In addition, the current research shows the benefits and potentials for a long-term impact assessment on the community.

5 Conclusions

Naturally, the sea is a public domain. Therefore, it is open to anyone who has an interest in it. The small-scale fishermen have the awareness to share their fishing area with fishermen from other villages. However, the roles share and responsibilities in managing fisheries resources are also required. The fishing villagers, who live traditionally and obtain their community engagement from blood relatives or friends' ties from the hereditary line, do not have serious difficulty realizing common goals. Those were expressed in the FGD, in-depth interviews, and physical evidence. It is also a form of their desire to be together in realizing sustainability.

Notwithstanding the limitations, a series of responses highlighting the importance of obtaining community feedback on sustainability must consider a participatory community approach to maximize the expertise contributed by participating parties. This finding has important implications for future research

activities and more intensive sustainability policy planning.

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