

Implementation Of Blue Accounting For Fisheries Msmes: A Review Of Par To Promote A Sustainable Ecosystem

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Abstract

This study aims to analyze the implementation of blue accounting in fisheries SMEs as an instrument to enhance sustainability performance by integrating environmental, social, and economic dimensions. The research also seeks to examine how participatory action research (PAR) can strengthen stakeholder involvement in adopting blue accounting practices. The research employed a qualitative approach using Focus Group Discussions (FGDs) as the main analysis tool. Participants consisted of fishermen, fisheries SMEs, local government representatives, and academics selected through purposive sampling. Data were analyzed using thematic analysis and validated through stakeholder reflection within the PAR framework to ensure contextual and practical relevance. The findings reveal that blue accounting positively contributes to improving sustainability performance in fisheries SMEs, although challenges remain in literacy, funding, and policy support. Stakeholder participation significantly enhances the effectiveness of implementation, ecological awareness accelerates adoption, and supportive policies alongside blue finance reinforce financial and environmental outcomes. The study proposes a three-stage implementation model: education, application, and monitoring, supported by policies and financing. This research contributes to the literature by offering a contextualized implementation model of blue accounting for fisheries SMEs through participatory action research. Unlike previous studies, it integrates stakeholder validation and emphasizes blue finance as a critical factor linking sustainability goals with SMEs' financial performance.

Keywords : Blue accounting, Fisheries SMEs, Participatory Action Research, Sustainability, Blue finance

1. INTRODUCTION

Indonesia is known as the largest archipelagic country in the world with more than 17,000 islands and a sea area covering about 70% of the country's total area. With its abundant marine biodiversity, the fisheries sector is one of the backbones of the national economy, both through marine product exports, job creation, and community food security (FAO, 2020). However, over-exploitation and poorly managed fishing practices have caused ecosystem damage, which ultimately reduces catches and threatens the sustainability of biodiversity (Pauly & Zeller, 2016).

In response to these threats, the concept of blue accounting has been introduced as a new approach to sustainable marine resource management. Blue accounting is an accounting system that integrates economic, social, and environmental aspects so that the impact of maritime activities, including fisheries, can be measured, reported, and managed transparently and accountably (Great Lakes Commission, 2017; UNEP, 2021). Thus, this approach can be an important instrument for balancing economic interests and marine ecosystem sustainability.

However, the application of blue accounting in Indonesia is still very limited, especially in the micro, small, and medium enterprises (MSMEs) fisheries sector. Most fisheries MSMEs still operate with a focus on short-term profits without considering environmental sustainability (Wijayanti & Hartono, 2020). The main obstacles to the implementation of blue accounting include a lack of understanding of this concept, limited managerial capacity, and minimal government policy support that encourages the implementation of sustainability principles in the fishing business (Sari, 2021; Nugraha, 2022).

Based on these conditions, this study focuses on the question: How can the implementation of blue accounting in Indonesian fisheries MSMEs support the sustainability of the fisheries business ecosystem? This study uses a participatory approach by involving all stakeholders so that the solutions produced are relevant to local needs and can be implemented effectively.

The urgency of this research is very high considering that the fisheries sector plays a strategic role in the national economy and the welfare of coastal communities. This sector not only provides employment for millions of people but also contributes significantly to Indonesia's food security. However, in recent years, there has been a significant decline in fish catches due to overfishing, climate change, and marine ecosystem degradation (Pauly & Zeller, 2016). Therefore, the application of blue accounting, which emphasizes transparency, accountability, and ecosystem sustainability, is considered very important to preserve marine resources while increasing the competitiveness of fisheries MSMEs.

2. LITERATURE REVIEW

Blue accounting has developed as a concept of sustainable accounting that focuses on marine resource management by emphasizing transparency and accountability. Abreu et al. (2019) explain that blue accounting is designed to ensure that economic activities in the maritime sector not only prioritize profit but also consider social and ecological impacts. This concept affirms that the success of a fishing business cannot be measured solely by its profit and loss statement, but also by its contribution to the preservation of the marine ecosystem. In the context of Indonesia, which has great maritime potential, the application of blue accounting is strategic for encouraging sustainability-based business transformation, especially in the fisheries MSME sector.

In the research by Syah et al. (2020), blue accounting is seen as an instrument that can improve the quality of sustainability reports while also serving as a communication tool between companies and stakeholders. Moozanah et al. (2024) emphasize that the implementation of this system in the fishing industry can build a positive perception of the balance between profitability and sustainability. This shows that blue accounting functions not only as a technical recording tool but also as a

managerial strategy that can improve the reputation and competitiveness of fisheries MSMEs. Thus, blue accounting is expected to strengthen business sustainability while creating sustainable added value.

Fisheries MSMEs play an important role in the national economy, both as providers of employment and contributors to food security. However, this sector also faces serious challenges such as overfishing, marine ecosystem damage, and climate change, which have an impact on declining productivity (FAO, 2020). In this context, the application of environmental accounting is essential to ensure that business continuity does not damage the ecosystems that support it. Khaddafi et al. (2024) show that blue accounting practices have a significant impact on the financial performance of MSMEs when accompanied by a commitment to sustainability. This means that the application of blue accounting is not merely idealistic but also has a direct impact on profitability.

Participatory Action Research (PAR) is a relevant methodological approach in supporting the implementation of blue accounting. According to Nyumba et al. (2018), PAR enables stakeholders to be directly involved in problem identification, strategy development, and solution implementation. In the context of fisheries MSMEs, the involvement of fishermen, entrepreneurs, local governments, and academics through PAR can ensure that the application of blue accounting is in line with local needs. Rabbaniyah et al. (2025) emphasize that this participatory approach can increase ecological awareness and accelerate the adoption of environmental accounting innovations. Thus, the integration of PAR with blue accounting can strengthen the effectiveness of the application of the concept of sustainability.

The blue economy concept broadens the scope of discussion by emphasizing the importance of business models that are not only environmentally friendly but also socially inclusive. Chuenpagdee and Jentoft (2022), through the idea of blue justice, emphasize that marine sustainability must involve justice for vulnerable coastal communities. Meanwhile, Charter et al. (2022) introduce the idea of a blue circular economy that focuses on the circular use of resources, including the processing of fishery waste into value-added products. These two concepts reinforce the argument that the application of blue accounting needs to be seen as part of a comprehensive strategy in building a sustainable and inclusive fisheries business ecosystem.

Bennett et al. (2024) add an important dimension in the form of blue finance, which is financing specifically directed at supporting environmentally friendly business activities in the marine sector. Access to this financing enables fisheries MSMEs to adopt sustainable business practices without being burdened by capital constraints. In the study by Ramadhan et al. (2024), policy support and access to blue finance were found to strengthen the relationship between the implementation of environmental accounting and company financial performance. In other words, the availability of financial resources plays an important role in bridging the idealism of sustainability with the daily business realities at the MSME level.

Ecological awareness is also a crucial factor in shaping sustainable business behavior. Rabbaniyah et al. (2025) emphasize that increasing environmental awareness among business actors encourages them to be more open to the application of blue accounting principles. Saputra and Laksmi (2025) show that a participatory approach can strengthen this awareness, especially in coastal areas that are vulnerable to environmental degradation. Therefore, ecological awareness can be viewed as a moderating variable that strengthens the relationship between the application of blue accounting and the sustainability of the fisheries business ecosystem. This makes individual cognitive aspects and attitudes important determinants of the successful implementation of the blue accounting concept.

The involvement of local communities in the PAR framework shows that the implementation of blue accounting is not merely a technical process, but also a social transformation. Tilley and Roscher (2020), through the ICT4SSF handbook, emphasize the importance of participatory data in strengthening sustainable fisheries management. The direct involvement of fishermen in the

recording, reporting, and evaluation processes can accelerate the adoption of sustainable accounting systems. Thus, the integration of the technical approach of blue accounting and the social approach of PAR will strengthen the legitimacy and effectiveness of implementation at the MSME level in fisheries.

Recent studies also show that the application of blue accounting can build synergy between economic and social goals. Saarani et al. (2023) explain that MSMEs that adopt blue economy practices have greater opportunities to access global markets due to increased demand for environmentally friendly products. Marroni (2025) adds that new factors in the blue economy business model, including consumer trust and regulatory support, strengthen business sustainability. Thus, the application of blue accounting can be positioned as a strategy to increase the competitiveness of MSMEs while meeting the demands of an increasingly environmentally conscious market.

From the synthesis of the theory and research results above, research hypotheses can be formulated that focus on the relationship between the application of blue accounting, stakeholder participation, ecological awareness, and policy and financing support. The first hypothesis is that the application of blue accounting in fisheries MSMEs has a positive effect on economic, social, and environmental sustainability performance. The second hypothesis states that stakeholder participation through PAR increases the effectiveness of blue accounting implementation. The third hypothesis is that ecological awareness moderates the relationship between blue accounting and the sustainability of the fisheries business ecosystem. The fourth hypothesis emphasizes that policy support and access to blue finance strengthen the relationship between the implementation of blue accounting and the financial performance of fisheries MSMEs.

3. RESEARCH METHOD

This study uses a qualitative approach with the main method being Focus Group Discussion (FGD) combined with a Participatory Action Research (PAR) framework. FGD was chosen because it is able to explore the understanding, experiences, and perceptions of various stakeholders regarding the implementation of blue accounting in fisheries MSMEs. As stated by Sutton and Arnold (2013), this method allows for dynamic interaction between participants, resulting in a richer perspective than individual interviews. Meanwhile, the PAR approach ensures that stakeholders are not only objects of research but are also actively involved in the process of identifying problems, formulating solutions, and validating research results.

The research was conducted in several stages. The first stage was preparation, which included developing research instruments, selecting locations, and identifying and recruiting participants. FGD participants were selected purposively, considering their direct involvement in fisheries activities and MSME management. Participant criteria included fishermen, fisheries MSME entrepreneurs, local government representatives, and academics with expertise in environmental accounting or sustainability. This selection aimed to ensure that the discussion results represented the diversity of experiences and interests within the fisheries business ecosystem.

The second stage was the implementation of the FGD. Each discussion session involved six to ten participants to ensure productive and balanced interaction. Trained moderators facilitated the discussions to ensure that each participant had the opportunity to express their views without domination by any particular individual. The discussion topics focused on understanding the concept of blue accounting, the challenges and obstacles to implementation, and the opportunities that can be utilized to promote the sustainability of fisheries MSMEs. The discussion also explored the participants' practical experiences in managing fisheries businesses and how the blue accounting system can be realistically applied in the local context.

The third stage was data processing and analysis. The FGD data was transcribed verbatim, then analyzed using thematic analysis techniques to identify patterns, themes, and relationships between variables. This technique was chosen because it is flexible in accommodating the complexity of qualitative data and allows researchers to gain a deep understanding of the issues faced by fisheries MSMEs. The analysis was conducted iteratively with the involvement of the research team members, so that the interpretation of the data could be validated through internal triangulation. This increased the credibility and reliability of the research results.

The fourth stage was the validation of the research results through joint reflection within the PAR framework. The preliminary results obtained from the thematic analysis were presented back to the stakeholders to obtain input and confirmation. This process allows for improvements and refinements to the findings to make them more relevant to practical needs in the field. In addition, this participatory validation provides legitimacy to the research results because it involves the parties who will be the main users of policy recommendations and blue accounting implementation models.

In this study, there are several targeted outputs. First, increasing stakeholder understanding of the concept and practice of blue accounting through the implementation of FGDs and short training sessions. Second, the formulation of evidence-based policy recommendations that can encourage the application of blue accounting in the MSME fisheries sector. Third, the development of a contextual blue accounting implementation model that can be replicated in other regions. The achievement indicators for these outputs include the implementation of FGDs, the availability of policy recommendation documents, and the publication of scientific articles in reputable national journals.

Overall, the research methodology is designed to answer the research questions and produce findings that have practical implications. The integration of FGDs and PAR allows the research to go beyond the theoretical level and produce a model that is applicable to MSME fisheries actors. Thus, this research not only contributes to the academic literature on blue accounting but also plays a direct role in promoting a more sustainable and inclusive fisheries business ecosystem. The research implementation process can be seen in the flowchart below:

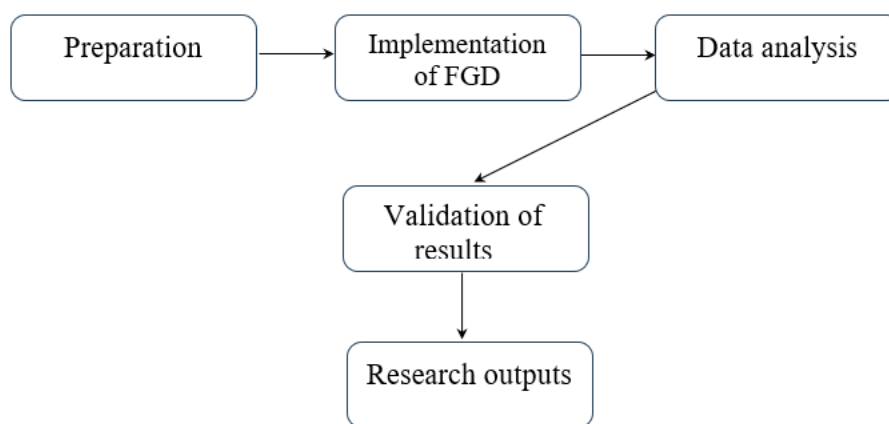


Figure 1. *Blue Accounting Research Roadmap for Fisheries MSMEs*

4. RESULTS

This research was conducted through a series of Focus Group Discussions (FGDs) involving various stakeholders, namely fishermen, fisheries MSME actors, local government representatives, and academics who understand the concept of sustainability. Each discussion session was attended by six to ten participants, ensuring an intensive dynamic conversation. The discussion process was facilitated using structured guidelines, covering an understanding of blue accounting, implementation challenges, sustainability opportunities, and necessary policy strategies. The transcripts were then

analyzed using a thematic analysis approach. This analysis revealed several main themes that became the focus of further discussion.

The first prominent theme is stakeholders' understanding of the concept of blue accounting. Most MSME fisheries actors are unfamiliar with the term, but they understand the importance of transparent and accountable business records. Fishermen emphasize that records are usually limited to daily profits and operating costs without taking into account environmental impacts. Local governments assess that the implementation of this system is still limited to pilot programs and has not yet reached a large scale. Academics underline the need to adapt the concept to make it simpler and easier for MSMEs to understand, so as not to cause resistance.

The second theme is the challenges of implementing blue accounting. FGD participants highlighted three main obstacles: limited accounting literacy, lack of policy support, and limited capital to implement sustainability practices. Some fishermen said that they were not yet accustomed to system-based recording and relied more on experience. MSME actors added that the additional burden of environmental recording was often considered irrelevant to short-term business needs. Local governments acknowledged that sustainability programs were often hampered by budget constraints, while academics assessed that the main challenge lay in integrating regulations with practices in the field.

The third theme that emerged was the opportunity to apply blue accounting to support sustainability. Despite many obstacles, FGD participants also highlighted the positive potential. Fishermen saw that with a better recording system, they could more accurately calculate the long term benefits of environmentally friendly practices. MSME actors assessed that adopting the concept of sustainability could increase the attractiveness of products in international markets that increasingly demand environmental certification. Local governments see blue accounting as an important instrument for strengthening fisheries governance, while academics consider its application to be an innovation in the national accounting system.

To clarify the findings, the following is a summary table of the results of the thematic analysis from the FGD:

Table 1. Results of the FGD thematic analysis

Main Theme	Sub-Findings
Understanding of Blue Accounting	Minimal understanding among MSMEs; concept considered complicated; requires local adaptation.
Implementation Challenges	Low accounting literacy, weak policies, limited capital, resistance to change.
Opportunities for Application	Increased market competitiveness, resource efficiency, legitimacy of local policies.
Stakeholder Roles	Fishermen focus on daily practices; MSMEs on the market; government on policy; academics on innovation.

The fourth theme was validation of results through reflection with stakeholders. At this stage, preliminary findings were presented again to FGD participants to obtain feedback. The results showed that the majority of participants agreed on the importance of implementing blue accounting as a sustainability instrument, but emphasized the need for ongoing training. Several participants proposed integrating recording with simple digital technology, such as mobile phone-based applications, which were considered more practical. Local governments welcomed this idea, noting the need for budgetary support and clearer regulations. This participatory validation strengthened the validity of the data and ensured that the recommendations produced were in line with practical needs in the field.

The final theme is research output in the form of an implementation model. From all the discussions and validations, a blue accounting implementation model for fisheries MSMEs was developed. This model includes three main stages: the education stage through simple accounting literacy training, the implementation stage of sustainability-based recording that emphasizes environmental and social aspects, and the monitoring and evaluation stage involving local governments and academics. This model is designed to be flexible and adaptable to MSMEs of different scales. In addition, this model is also integrated with policy recommendations that support the provision of incentives for MSMEs that successfully implement sustainability principles.

The following is the Blue Accounting implementation model for fisheries MSMEs.



Figure 2. *Blue Accounting Implementation Model in Fisheries MSMEs*

5. DISCUSSION

The results of this study show that understanding of blue accounting is still low among fisheries MSME actors. This finding is in line with the research by Jha et al. (2021), which shows that the adoption of environmental accounting in MSMEs in developing countries is still hampered by low accounting literacy. This lack of understanding makes it difficult for business actors to link financial recording activities with environmental impacts. Therefore, the concept needs to be simplified to make it more contextual. Saputra and Laksmi (2025) emphasize the importance of simplifying the concept of the blue economy to facilitate understanding among coastal MSMEs.

Regarding implementation challenges, the results of this study confirm limitations in accounting literacy, capital, and policy support. This is consistent with the findings of Moozanah et al. (2024), which show that the fishing industry's perception of blue accounting is often negative because it is considered a burden on business. However, these challenges can also be seen as opportunities to strengthen the role of local governments and academics in providing technical support. The research by Khaddafi et al. (2024) even emphasizes that stakeholder involvement has a significant influence on the success of blue accounting implementation. Thus, the solutions offered must be collaborative in nature.

In terms of implementation opportunities, this study found that MSMEs see great potential in expanding market access through sustainable practices. These results are in line with the research by Saarani et al. (2023), which emphasizes that MSME involvement in the blue economy opens up opportunities to enter global markets that are increasingly demanding environmental standards. This awareness is an important motivation that can encourage MSME actors to transform. Rabbaniyah et

al. (2025) also add that increasing ecological awareness at the coastal community level acts as a catalyst for the adoption of sustainable practices, including blue accounting.

Findings related to the validation of research results show that stakeholder participation through joint reflection increases the validity of recommendations. This reinforces the argument of Nyumba et al. (2018), which emphasizes the effectiveness of participatory methods in conservation research. Participatory validation ensures that research results are not only academically valid, but also practically applicable. Furthermore, this shows that stakeholders are not merely objects of research, but also agents of change who play an active role in formulating solutions. Thus, the PAR approach has proven to be relevant in ensuring the successful implementation of the blue accounting concept in fisheries MSMEs.

The results of developing a blue accounting implementation model contribute significantly to the development of both literature and practice. This model, which consists of education, application, and monitoring stages (), is in line with the concept of continuous improvement that is often applied in quality management systems. Bennett et al. (2024) add that the successful implementation of sustainable practices in the fisheries sector is greatly influenced by financial support or blue finance. Therefore, the model produced by this study will be more effective if it is integrated with environmentally friendly incentive and financing mechanisms. This implication is important for local governments and financial institutions that want to encourage a more sustainable fisheries sector.

Overall, this study shows that the implementation of blue accounting can support the sustainability of the fisheries business ecosystem if carried out through a collaborative and participatory approach. The results of the study reinforce the hypothesis that the application of blue accounting has a positive effect on sustainability performance, and that the level of stakeholder participation strengthens its effectiveness. In addition, ecological awareness has been shown to moderate this relationship by accelerating the adoption of sustainable principles. Policy support and access to environmentally friendly financing have also been proven to be significant reinforcing factors. Thus, this study not only provides conceptual contributions but also practical recommendations for the development of a sustainable fisheries sector in Indonesia.

6. CONCLUSIONS

This study concludes that the application of blue accounting in fisheries MSMEs has great potential to support the sustainability of the business ecosystem. The results of the analysis show that MSME actors' understanding of this concept is still limited, but there is an awareness of the importance of transparent business records. The challenges that arise include low accounting literacy, limited capital, and a lack of policy support. Nevertheless, opportunities for implementation remain open, particularly in increasing market competitiveness, improving business efficiency, and strengthening the legitimacy of more inclusive sustainability-based policies.

Based on the results of this study, it is recommended that future research expand the analysis with a quantitative approach to measure the direct impact of blue accounting implementation on financial, social, and environmental performance. Comparative studies between regions are also needed to examine contextual factors that influence the effectiveness of implementation. Future research could also explore the integration of digital technology in recording and reporting, thereby facilitating adoption among MSMEs. Thus, the results of this study can serve as a basis for more comprehensive further studies and make a real contribution to sustainable fisheries development in Indonesia.

IMPLICATIONS FOR RESEARCH

This study also confirms that stakeholder participation through the Participatory Action Research approach plays an important role in strengthening the effectiveness of implementation. Joint validation with stakeholders shows that ecological awareness encourages acceptance of the blue accounting concept, while policy support and access to environmentally friendly financing strengthen the relationship with the financial performance of MSMEs. These findings have resulted in an implementation model that includes the stages of education, application, and monitoring and evaluation, with policy support and blue finance as the main reinforcements. This model is flexible and can be replicated in other coastal areas with contextual adjustments.

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