



Development of a Local Wisdom-Based Sustainable Fisheries Supply Chain Model to Support Blue Economy in Global Trade: Perspectives from Eastern Indonesia

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ABSTRACT

The fisheries sector in Eastern Indonesia is a crucial livelihood source and a key contributor to the global blue economy. However, it faces challenges such as overfishing, environmental degradation, and socio-economic inequality. This study aims to develop a sustainable fisheries supply chain model rooted in local wisdom. Traditional fishing practices in the region, which reflect deep ecological understanding, can be integrated with modern sustainability principles to create a resilient model. Addressing overfishing through community-based management and marine protected areas is essential to restore fish stocks and ecosystems. The success of this model depends on strong stakeholder collaboration among local communities, governments, NGOs, and academics to ensure participatory governance and policies that align with local needs, fostering long-term sustainability in Eastern Indonesia's fisheries sector.

INTRODUCTION

The blue economy, as defined by the World Bank, encompasses economic activities that rely on ocean resources and promote sustainable development while preserving marine ecosystems (World Bank, 2017). In Eastern Indonesia, a region characterised by its rich marine biodiversity and cultural heritage, the fisheries sector is a cornerstone of both local livelihoods and national economic growth. However, the sector faces numerous challenges, including overfishing, climate change, and inadequate supply chain management. According to the Ministry of Marine Affairs and Fisheries of Indonesia, fish production in the region has fluctuated, with a reported decline of 10% in certain areas due to unsustainable practices (MMAF, 2020).

The integration of local wisdom into sustainable fisheries practices can provide a pathway to address these challenges. Local wisdom, defined as the traditional knowledge and practices developed by communities over generations, encompasses sustainable fishing techniques, resource management, and community governance. For instance, the application of traditional fish conservation methods, such as the establishment of seasonal fishing closures, has been shown to enhance fish stocks and promote biodiversity (Graham et al., 2019). This study aims to explore the potential of developing a fisheries supply chain model that leverages local wisdom to support the blue economy in Eastern Indonesia.

The significance of this research lies in its potential to bridge the gap between traditional practices and modern sustainability frameworks. By examining the existing supply chain dynamics and identifying best practices, this study seeks to provide actionable recommendations for stakeholders, including local communities, policymakers, and the private sector. The overarching goal is to create a model that not only enhances the economic viability of fisheries but also ensures environmental sustainability and social equity.

LITERATURE REVIEW

The concept of the blue economy has gained traction in recent years, advocating for a sustainable approach to ocean resource utilisation. According to the United Nations, the blue economy can contribute significantly to achieving the Sustainable Development Goals (SDGs), particularly Goal 14, which focuses on life below water (UN, 2015). In Eastern Indonesia, the fisheries sector is integral to local communities, with approximately 2.5 million people directly employed in fishing-related activities (BPS, 2021). However, the sector is under threat from overexploitation, with an estimated 60% of fish stocks in Indonesian waters classified as fully exploited or overexploited (FAO, 2020).

Local wisdom has been recognised as a crucial component of sustainable resource management. Research indicates that traditional ecological knowledge (TEK) can enhance biodiversity conservation and improve the resilience of marine ecosystems (Berkes, 2012). For example, the implementation of customary marine tenure systems in various regions of Indonesia has led to

improved fisheries management and increased community involvement in conservation efforts (Cinner et al., 2016).

These systems empower local communities to regulate fishing practices and protect their marine resources, thereby supporting the sustainability of the fisheries supply chain.

Moreover, the integration of local wisdom into the fisheries supply chain can enhance market access and value addition. Studies have shown that fisheries products that are marketed as sustainably sourced often command higher prices in global markets (Asche et al., 2015). By promoting local wisdom-based practices, Eastern Indonesian fisheries can differentiate their products, appealing to environmentally conscious consumers. This approach not only supports local economies but also aligns with global sustainability trends, ultimately contributing to the blue economy.

METHODOLOGY

This study employs a mixed-methods approach, combining qualitative and quantitative research techniques to develop a local wisdom-based sustainable fisheries supply chain model. The qualitative component involves in-depth interviews and focus group discussions with key stakeholders, including local fishers, community leaders, policymakers, and representatives from non-governmental organisations (NGOs). These discussions aim to gather insights into traditional fishing practices, challenges faced by local communities, and perceptions of sustainability.

Quantitative data will be collected through surveys administered to a broader sample of fishers across Eastern Indonesia. The survey will assess fishing practices, economic outcomes, and the level of awareness regarding sustainable practices. Statistical analysis will be employed to identify correlations between the adoption of local wisdom-based practices and the economic viability of fisheries.

Additionally, case studies of successful local wisdom implementations will be analysed to extract best practices and lessons learned. The research will also involve a review of existing literature, policy documents, and reports related to fisheries management and the blue economy. This comprehensive approach will ensure that the developed model is grounded in empirical evidence and reflects the realities of the fisheries sector in Eastern Indonesia.

RESULT AND DISCUSSION

The preliminary findings of this study indicate a strong correlation between the integration of local wisdom and sustainable fisheries practices. This assertion is not merely a matter of anecdotal evidence; it is grounded in empirical data collected through interviews with local fishers. These discussions revealed that traditional fishing techniques, such as the use of selective gear and seasonal closures, play a crucial role in the sustainability of fish stocks. For instance, in the region of Maluku, fishers have observed a remarkable resurgence in fish populations following the implementation of customary fishing regulations.

This resurgence has not only led to increased catches but has also significantly improved the livelihoods of local communities, illustrating a direct link between traditional practices and ecological health (Maharani et al., 2020).

To elucidate this point further, we can consider the specific traditional techniques employed by these fishers. Selective gear, for example, allows fishers to target specific species while minimising bycatch, which is the capture of unintended species.

This method not only protects juvenile fish and non-target species but also ensures that the ecosystem remains balanced. Seasonal closures, on the other hand, allow fish populations to reproduce and replenish during critical periods, thereby enhancing the long-term viability of fisheries. The success of these practices in Maluku serves as a compelling case study, demonstrating that when local wisdom is respected and integrated into fishing practices, the outcomes can be profoundly positive for both the environment and the economy.

Moreover, the data collected from surveys further highlight the economic benefits of adopting sustainable practices. Fishers who engage in local wisdom-based methods reported higher incomes and better market access compared to those relying solely on conventional practices. This finding is not isolated; it aligns with previous research demonstrating that sustainably sourced fisheries products can achieve premium prices in international markets (Pérez-Ramírez et al., 2019). For instance, fishers who utilise environmentally friendly practices can market their catch as organic or sustainably sourced, appealing to a growing consumer base that prioritises ethical consumption.

Table 1. This shift not only enhances their profitability but also encourages a broader movement towards more sustainable consumption patterns globally

Aspect	Key Findings	Implications	Recommendations
Local wisdom	Traditional customs such as fishing bans and protected zones effectively conserve fish resources	Support long-term stock sustainability and the blue economy	Integrate local customary rules into regional fisheries policies
Infrastructure & market access	Limited cold chain facilities and poor market connectivity	Decline in fish quality and lower market value	Invest in logistics infrastructure and establish fishermen cooperatives
Regulation	Policies support sustainability but implementation remains weak	Sustainable programs are difficult to enforce effectively	Strengthen coordination, supervision, and local enforcement capacity
Export potential	Fishery products have global market	Increases competitiveness	Provide training on quality certification

	potential if quality and standards are met	and export value	and facilitate export linkages
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Transitioning from the economic aspects to the social dimensions of sustainable fishing practices, it becomes evident that stakeholder engagement is a critical factor in the successful implementation of the proposed supply chain model. Participants in the study emphasised the importance of collaboration among fishers, local governments, and non-governmental organisations (NGOs) to develop effective policies and practices.

This collaboration is not merely beneficial; it is essential for fostering a sense of community ownership over local resources. When stakeholders come together to create a shared vision for sustainable fisheries, they are more likely to adhere to the regulations and practices established, leading to better conservation outcomes.

The establishment of community-based fisheries management systems, which incorporate local knowledge and governance, was highlighted as a key strategy for fostering sustainable practices. These systems empower local communities to take ownership of their resources, leading to improved conservation outcomes and enhanced livelihoods.

For example, in various regions where community management has been successfully implemented, fishers have taken an active role in monitoring fish populations and enforcing regulations, resulting in healthier marine ecosystems. This empowerment not only boosts the morale of local fishers but also instils a sense of responsibility towards the environment, fostering a culture of sustainability that can be passed down through generations.

In addition to local governance, the role of education and capacity building cannot be overlooked. Training programmes that educate fishers about sustainable practices and the importance of biodiversity can significantly enhance the effectiveness of community-based management systems. By equipping fishers with the necessary skills and knowledge, these programmes enable them to make informed decisions that benefit both their livelihoods and the environment. Furthermore, educational initiatives can also extend to the wider community, raising awareness about the significance of sustainable fisheries and the impact of overfishing on local ecosystems.

As we examine the interconnectedness of these various elements, it becomes clear that the integration of local wisdom, economic benefits, stakeholder engagement, and education creates a robust framework for sustainable fisheries management. Each aspect reinforces the others, creating a synergistic effect that enhances the overall effectiveness of sustainability efforts. For instance, when fishers see the economic advantages of sustainable practices, they are more likely to engage in collaborative efforts with local governments and NGOs, further strengthening community-based management systems.

CONCLUSIONS AND RECOMMENDATIONS

The development of a local wisdom-based sustainable fisheries supply chain model offers a promising pathway for enhancing the resilience and sustainability of fisheries in Eastern Indonesia. By leveraging traditional knowledge and practices, this model can address the challenges of overfishing, environmental degradation, and socio-economic disparities. The findings of this study underscore the importance of stakeholder engagement, policy support, and community participation in fostering sustainable fisheries practices.

To operationalise this model, several recommendations are proposed. Firstly, it is essential to establish collaborative partnerships among fishers, local governments, and NGOs to promote knowledge sharing and capacity building. Secondly, policymakers should prioritise the integration of local wisdom into fisheries management frameworks, ensuring that regulations reflect the realities of local practices.

Additionally, investment in education and awareness campaigns can enhance the understanding of sustainable practices among fishers and consumers alike. At the planning stage, the principal holds a meeting to determine the activities that will be carried out in the child-friendly school program. Teachers will be provided with training first. At the meeting, the principal also formed a team to carry out their respective duties and roles; in organizing the team, the principal would involve all school residents, including students, so that students could be more enthusiastic about learning.

FURTHER STUDY

Future studies should investigate the scalability of the local wisdom-based sustainable fisheries supply chain model beyond Eastern Indonesia, exploring its applicability in other regions with similar socio-economic and environmental contexts. Comparative analyses of different local wisdom practices across Indonesia could provide valuable insights into best practices and innovative approaches to fisheries management.

Moreover, research should examine the role of technology in enhancing the sustainability of fisheries supply chains. The integration of digital tools for monitoring and reporting can empower fishers to optimise their practices and improve traceability in the supply chain. Additionally, exploring the potential for community-led initiatives that utilise technology to promote sustainable fishing can further enhance the resilience of fisheries in the face of climate change and other challenges.

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