

Integrating ESG Principles into Sustainable Fisheries Resource Management: A Strategic Framework for Indonesia's 2045 Blue Economy Vision

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Abstract

Marine ecosystems face escalating risks from overfishing, habitat degradation, pollution, and climate change, threatening both biodiversity and the livelihoods of coastal communities dependent on fisheries. Despite growing global commitments to sustainable ocean governance, fisheries management frameworks often lack integrated mechanisms that simultaneously address environmental, social, and governance (ESG) dimensions. This study examines how an ESG framework can be applied to mitigate marine ecosystem risks and advance sustainable fisheries resource management, with particular attention to Indonesia's 2045 Blue Economy Vision. Using a qualitative approach based on literature review and policy analysis, this research identifies key environmental risks (e.g., overexploitation and ecosystem degradation), social dimensions (e.g., community welfare and equitable resource access), and governance gaps (e.g., regulatory enforcement and stakeholder accountability) within the fisheries sector. The findings suggest that integrating ESG principles into fisheries policy can enhance ecosystem resilience, improve regulatory compliance, and strengthen long-term economic sustainability. This study contributes to the discourse on sustainable ocean governance by proposing an ESG-based strategic framework that aligns fisheries management with national blue economy targets, offering practical implications for policymakers, industry stakeholders, and coastal communities seeking to balance ecological preservation with economic growth toward 2045.

INTRODUCTION

Marine ecosystems constitute one of the most vital yet increasingly vulnerable components of global environmental and economic systems. They provide essential ecosystem services, including food security, livelihood generation, carbon sequestration, and biodiversity conservation, particularly for archipelagic nations such as Indonesia, whose economy and society are deeply intertwined with ocean resources. However, decades of overexploitation, habitat destruction, illegal, unreported, and unregulated (IUU) fishing, pollution, and the accelerating impacts of climate change have placed unprecedented pressure on marine ecosystems, threatening the long-term sustainability of fisheries resources upon which millions of coastal communities depend. In response to these mounting challenges, the concept of the Blue Economy has emerged as a strategic paradigm that seeks to balance economic growth derived from ocean resources with environmental sustainability and social equity. Indonesia, as one of the world's largest maritime nations, has articulated this commitment through its 2045 Blue Economy Vision, which aims to position sustainable ocean-based development as a central pillar of national economic growth while safeguarding marine ecological integrity for future generations. Achieving this vision, however, requires more than conventional fisheries management approaches; it demands a

comprehensive governance framework capable of addressing the interconnected environmental, social, and institutional dimensions of marine resource utilization. Environmental, Social, and Governance (ESG) frameworks, widely adopted in corporate sustainability and investment decision-making, offer a promising lens through which fisheries governance can be restructured. ESG principles emphasize not only environmental stewardship but also social responsibility toward local communities and robust governance mechanisms that ensure accountability, transparency, and regulatory compliance. Despite the growing relevance of ESG in sustainability discourse, its application within the fisheries and marine resource sector remains underexplored, particularly in the context of developing economies where regulatory enforcement and stakeholder coordination often present significant challenges. This gap in the literature raises an important question: how can an ESG framework be strategically integrated into fisheries resource management to mitigate marine ecosystem risks³ while supporting the achievement of Indonesia's 2045 Blue Economy Vision? Addressing this question is critical, as fragmented or siloed approaches to fisheries governance risk undermining both ecological resilience and long-term economic sustainability. Accordingly, this study aims to (1) identify the key environmental, social, and governance risks affecting marine ecosystems and fisheries resources, (2) analyze how ESG principles can be systematically integrated into fisheries management practices, and (3) propose a strategic ESG-based framework that supports the realization of the 2045 Blue Economy Vision. By bridging ESG theory with fisheries governance, this research contributes both theoretically and practically to the discourse on sustainable ocean management, offering insights relevant to policymakers, industry actors, and coastal communities navigating the transition toward a resilient and equitable blue economy.

METHODS

1. Research Approach This study employs a qualitative research approach based on a systematic literature review and policy analysis. This approach is deemed appropriate given the conceptual and exploratory nature of the research, which aims to synthesize existing knowledge on marine ecosystem risks, ESG principles, and fisheries governance in order to construct a strategic framework aligned with Indonesia's 2045 Blue Economy Vision. 2. Data Sources Data for this study were obtained from secondary sources, including peer-reviewed academic journals, government policy documents, national and international reports on marine and fisheries governance, and publications related to ESG frameworks and blue economy strategies. Relevant national policy instruments, such as Indonesia's fisheries regulations and blue economy roadmaps, were also reviewed to contextualize the analysis within the national policy landscape. 3. Data Collection Technique Data for this study were obtained from secondary sources, including peer-reviewed journals, government policy documents, national and international reports, ESG and blue economy publications, and relevant Indonesian fisheries regulations and blue economy policy roadmaps. 4. Data Analysis Technique The collected data were analyzed using a qualitative descriptive-analytical method, involving thematic categorization of environmental, social, and governance factors relevant to fisheries management. This analysis was used to identify patterns,

gaps, and interrelationships among ESG dimensions and marine ecosystem risks, which subsequently informed the development of a strategic ESG-based framework for sustainable fisheries resource management. 5. Framework Development Based on the synthesized findings, this study constructs a conceptual ESG-integrated framework tailored to fisheries governance, aligning environmental risk mitigation, social equity considerations, and governance accountability mechanisms with the strategic objectives of the 2045 Blue Economy Vision.

RESULTS AND DISCUSSION

1. Marine Ecosystem Risks and Fisheries Sustainability Marine ecosystems are exposed to a range of interconnected risks that undermine the sustainability of fisheries resources. Overfishing remains one of the most pressing threats, driven by increasing global demand for seafood and insufficient enforcement of catch limits, leading to the depletion of fish stocks and disruption of marine food webs. Habitat degradation, resulting from destructive fishing practices, coastal development, and pollution, further exacerbates biodiversity loss and reduces the resilience of marine ecosystems. Additionally, climate change intensifies these pressures through ocean warming, acidification, and shifting species distributions, compounding the vulnerability of fisheries-dependent communities. Illegal, unreported, and unregulated (IUU) fishing continues to pose a significant governance challenge, particularly in archipelagic states with extensive maritime boundaries and limited monitoring capacity. 2. Environmental, Social, and Governance (ESG) Framework The ESG framework has gained prominence as a holistic approach to assessing sustainability performance across three interrelated dimensions. The environmental dimension addresses ecological impact and resource stewardship; the social dimension emphasizes community welfare, equitable access, and stakeholder engagement; and the governance 4 dimension focuses on accountability, transparency, and regulatory compliance. While ESG principles originated primarily within corporate and investment contexts, their application has gradually expanded into natural resource management sectors, including forestry, energy, and increasingly, fisheries. Scholars argue that ESG integration enables a more systemic approach to sustainability, moving beyond isolated environmental interventions toward frameworks that simultaneously consider social equity and institutional accountability. 3. Blue Economy and Sustainable Fisheries Governance The Blue Economy concept advocates for the sustainable use of ocean resources to drive economic growth, improve livelihoods, and preserve marine ecosystem health. Within this paradigm, sustainable fisheries governance is positioned as a critical enabler, requiring integrated policies that balance economic productivity with ecological limits. Indonesia's 2045 Blue Economy Vision reflects this ambition, emphasizing sustainable fisheries management, marine spatial planning, and community-based resource governance as strategic priorities. However, existing literature suggests that fisheries governance in many developing maritime economies remains fragmented, with limited integration between environmental regulation, social welfare programs, and institutional oversight mechanisms. 4. Integrating ESG into Fisheries Management Recent studies have begun to explore the applicability of ESG frameworks to fisheries and aquaculture sectors, highlighting their potential to enhance risk mitigation, improve stakeholder accountability, and strengthen long-term resource sustainability. Environmental criteria within fisheries ESG applications typically encompass stock assessment, ecosystem protection, and pollution control; social criteria address

labor conditions, community livelihoods, and equitable resource distribution; while governance criteria focus on regulatory compliance, anti-corruption measures, and transparent decision-making processes. Despite these emerging insights, empirical research examining the systematic integration of ESG principles into national fisheries policy—particularly within the context of blue economy strategies—remains limited, indicating a clear gap that this study seeks to address.

DISCUSSION

1. **Environmental Dimension: Mitigating Marine Ecosystem Risks** The literature synthesis reveals that environmental risks to marine ecosystems are predominantly driven by overfishing, habitat degradation, and climate-related stressors. Within an ESG framework, the environmental dimension translates into measurable indicators such as sustainable catch quotas, marine protected area (MPA) coverage, ecosystem restoration initiatives, and reduction of destructive fishing practices. Findings indicate that fisheries policies incorporating science-based stock assessments and adaptive management measures demonstrate greater resilience against overexploitation. Furthermore, integrating climate adaptation strategies—such as monitoring ocean temperature shifts and species migration patterns into fisheries planning enhances the capacity of coastal ecosystems to withstand environmental stressors. These findings underscore that environmental risk mitigation cannot be addressed through isolated conservation efforts alone but requires systemic integration into fisheries governance structures.

2. **Social Dimension: Community Welfare and Equitable Resource Access** The social dimension of the ESG framework highlights the centrality of coastal communities and small-scale fishers in sustainable fisheries management. Findings from the reviewed literature indicate that fisheries policies often overlook social equity considerations, resulting in unequal access to marine resources and inadequate protection of traditional fishing rights. An ESG-based approach emphasizes community-based fisheries management, capacity building, and fair labor practices within the fisheries value chain. Empowering local communities through participatory governance mechanisms not only strengthens social legitimacy but also enhances compliance with conservation measures, as communities with direct stakes in resource sustainability are more likely to support long-term management objectives.

3. **Governance Dimension: Strengthening Institutional Accountability** Governance emerges as a critical yet frequently underdeveloped dimension within existing fisheries management frameworks. The analysis reveals persistent challenges related to weak regulatory enforcement, limited monitoring capacity, and susceptibility to illegal, unreported, and unregulated (IUU) fishing practices. Applying ESG governance principles suggests the need for enhanced regulatory transparency, cross-agency coordination, and the adoption of technology-based monitoring systems, such as satellite tracking and digital catch reporting, to improve compliance and accountability. Strengthening institutional governance is identified as a foundational requirement for the effective implementation of both environmental and social ESG components within the fisheries sector.

4. **Proposed ESG-Integrated Framework for Sustainable Fisheries** Building on the thematic findings across the three ESG dimensions, this study proposes an integrated strategic framework comprising the following components: the Environmental Pillar, encompassing science-based resource management, ecosystem protection, and climate resilience integration; the Social Pillar, encompassing community empowerment, equitable resource distribution, and protection of small-scale fisher livelihoods; and the Governance Pillar, encompassing regulatory strengthening, transparency mechanisms, and technology-enabled enforcement. This framework positions ESG

principles not merely as evaluative criteria but as strategic pillars for restructuring fisheries governance in alignment with Indonesia's 2045 Blue Economy Vision. The interdependence among the three pillars suggests that fragmented policy interventions addressing only one dimension are unlikely to achieve sustainable outcomes; rather, an integrated approach is essential to simultaneously mitigate marine ecosystem risks, safeguard social welfare, and strengthen institutional accountability. 5. Implications for Achieving the 2045 Blue Economy Vision The findings suggest that ESG integration offers a viable pathway to operationalize the 2045 Blue Economy Vision by aligning fisheries management with broader sustainability commitments. Policymakers are encouraged to embed ESG indicators within national fisheries regulations, while industry stakeholders can leverage ESG-aligned practices to enhance longterm resource viability and market competitiveness. For coastal communities, ESG-based governance offers greater assurance of equitable participation and protection of livelihoods amid ongoing marine resource pressures.

CONCLUSION

This study demonstrates that mitigating marine ecosystem risks and achieving sustainable fisheries resource management require a comprehensive and integrated approach that extends beyond conventional environmental interventions. By applying an ESG framework—encompassing environmental protection, social equity, and governance accountability—this research identifies a strategic pathway through which Indonesia's fisheries sector can address overfishing, habitat degradation, and climate-related risks while safeguarding the welfare of coastal communities and strengthening institutional oversight. The findings reveal that environmental risk mitigation is most effective when coupled with community-based social empowerment and robust governance mechanisms, rather than treated as an isolated policy objective. The proposed ESG-integrated framework, comprising environmental, social, and governance pillars, offers a practical and conceptually grounded model for restructuring fisheries governance in alignment with the 2045 Blue Economy Vision. This integrated approach underscores that achieving long-term marine sustainability is inherently a multidimensional undertaking, requiring coordinated action among policymakers, industry stakeholders, and coastal communities. Theoretically, this study contributes to the growing discourse on ESG application within natural resource governance, extending its relevance beyond corporate sustainability into the domain of marine and fisheries management. Practically, the findings offer actionable guidance for policymakers seeking to embed ESG principles into national fisheries regulations and for industry actors aiming to align operational practices with sustainability standards. Nevertheless, this study is not without limitations, as it relies primarily on secondary data and qualitative literature synthesis rather than empirical field data. Future research is recommended to conduct empirical validation of the proposed ESG framework through case studies, stakeholder surveys, or quantitative impact assessments within specific fisheries contexts. Such efforts would further strengthen the practical applicability of ESG-based governance in advancing Indonesia's pursuit of a resilient, equitable, and sustainable blue economy by 2045.

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