Implementation Of Sustainable Development Principles In Marine Resources Exploration And Exploitation Licensing

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Abstract

This study examines the implementation of sustainable development principles in the licensing system for the exploration and exploitation of marine resources in Indonesia. As the largest archipelago in the world with a coastline of 99,093 kilometers and waters of 5.8 million square kilometers, Indonesia has significant marine economic potential but faces challenges in sustainable utilization. Using a socio- legal approach, the research was conducted in three locations (Anambas Islands, Bintan, and Bangka) by analyzing the regulatory framework and its implementation in the field. The results show significant fragmentation in the regulatory framework with 12 sectoral laws and 8 ministries/institutions having authority related to licensing, where only 42% of regulations explicitly integrate sustainability principles. Field findings reveal substantial gaps between regulation and implementation, including a lack of post-permit monitoring, limited capacity to assess ecological sustainability, and low community participation in the permitting process. Obstacles to implementation include conflict of norms between regulations, limited institutional capacity, and weak coordination between institutions. Based on an analysis of best practices from Australia, Norway, and the Philippines, this study proposes a sustainable licensing model for Indonesia that includes regulatory reform, spatially based integrated licensing systems, strengthening environmental impact assessment mechanisms, developing integrated information systems, and strengthening community participation through co-management. The implementation of this model has the potential to support the development of the Blue Economy in Indonesia by increasing the economic value of marine resources by up to 30% in 10 years, reducing resource utilization conflicts, and reversing the trend of degradation of marine ecosystems.

Keywords: Sustainable Development; Blue Economy; Marine Policy

1. INTRODUCTION

Indonesia, as the largest archipelagic country in the world with a coastline of 99,093 kilometers, has tremendous potential for marine resources. Indonesia's waters, which cover 5.8 million square kilometers, including 3.1 million square kilometers of the Exclusive Economic Zone (EEZ), hold a wealth of marine biodiversity and significant economic potential. Based on data from the Ministry of Maritime Affairs and Fisheries, the economic value of Indonesia's marine resources is estimated to reach USD 1.2 trillion per year. However, the use of these resources is not optimal and often does not pay attention to sustainability aspects, which ultimately threatens the sustainability of marine ecosystems and impacts the welfare of coastal communities. The concept of sustainable development carried out in various international forums, including the Sustainable Development Goals (SDGs), especially in Goal 14 "Life Below Water", has encouraged countries to integrate sustainability principles in the use of marine resources[1]. Indonesia, as a country that has ratified various international conventions related to the environment and oceans, such as the United Nations Convention on the Law of the Sea (UNCLOS), the Convention on Biological Diversity

(CBD), and the Paris Agreement, has an obligation to implement these principles within the framework of national regulations. As a manifestation of this commitment, Indonesia has stipulated Law Number 32 of 2014 concerning Marine Affairs which affirms its commitment to manage marine resources in a sustainable manner. However, there is a significant gap between legal commitment (das sollen) and implementation on the ground (das sein). The licensing system as an instrument of control and supervision is the main entrance in ensuring that marine resource exploration and exploitation activities run in accordance with the principles of sustainable development. Through the licensing mechanism, the state can regulate how marine resources are utilized, who has access to these resources, and ensure that utilization activities provide economic benefits without damaging the environment. However, the current licensing system tends to be fragmented among various agencies and sectors, creating overlapping authority and inconsistencies in the application of sustainability principles. The fragmentation of marine licensing regulations in Indonesia can be seen from the existence of various regulations issued by different sectors. For underwater oil and gas exploration, it is regulated through Law Number 22 of 2001 concerning Oil and Gas, while for capture fisheries and aquaculture is regulated in Law Number 45 of 2009 concerning Fisheries. In addition, licensing for marine tourism is regulated in Law Number 10 of 2009 concerning Tourism, marine mineral mining is regulated in Law Number 3 of 2020 concerning Amendments to Law Number 4 of 2009 concerning Mineral and Coal Mining, and bioprospecting activities that still do not have a clear legal umbrella. This situation causes a conflict of norms between regulations and a legal vacuum in several aspects. For example, the absence of regulations specifically governing the procedures for assessing the cumulative impact of different activities in the same marine area, which has the potential to cause greater environmental damage than the individual impacts of each activity. In recent years, cases of environmental damage due to unsustainable exploration and exploitation of marine resources have become increasingly prevalent. The oil spill in Balikpapan Bay in 2018 which polluted around 7,000 hectares of waters and damaged 60 hectares of mangrove forests, illegal sea sand mining in various coastal areas such as the Riau Islands and Bangka Belitung which caused coastal erosion and coral reef damage, as well as overfishing practices that caused a 38% decline in fish stocks in some fisheries management areas are clear evidence of the weak implementation of sustainability principles in the licensing system. In addition to having an impact on the environment, these practices also harm the national economy with estimated losses of Rp 30 trillion per year and threaten the welfare of around 8.9 million coastal communities who depend on marine resources. Previous research has identified various weaknesses in the marine licensing system in Indonesia. Gustina (2019) in his study on "The Effectiveness of Capture Fisheries Licensing in Preventing Overfishing in Indonesian Waters"

[1] Tomáš Hák, Svatava Janoušková, and Bedřich Moldan, “Sustainable Development Goals: A Need for Relevant Indicators,” *Ecological Indicators* 60 (January 2016): 565–73, https://doi.org/10.1016/j.ecolind.2015.08.003.

found that the current fisheries licensing system is not effective in controlling fishing rates due to weak coordination between institutions and limited supervision capacity. Meanwhile, Putra & Sunyowati (2020) in a study entitled "Harmonization of Marine Mineral Mining Regulations in the Indonesian Maritime Law Framework" revealed that there are inconsistencies between the Mining Law and the Marine Law in regulating marine mining licensing, which causes legal uncertainty for business actors and weakens environmental protection aspects. Furthermore, a comparative study by Damanik (2022) on "Integrated Coastal Management: Lessons from Global Best Practices for Indonesia" shows that Indonesia lags behind in adopting an integrated approach to coastal area management compared to countries such as Australia and the Philippines. However, the three studies have not comprehensively examined how the principles of sustainable development can be integrated into the overall licensing system for the exploration and exploitation of marine resources, especially in the context of the implementation of the Blue Economy concept. The Blue Economy approach that emphasizes the sustainable use of marine resources for economic growth, improved welfare, and ecosystem preservation is relevant to be applied in the context of licensing. This concept, which was first introduced by Gunter Pauli in 2010 and later adopted in various international forums such as the UN Ocean Conference, offers a new paradigm in viewing marine resources not only as an extractive commodity, but as development capital that needs to be managed sustainably. The integration of the Blue Economy concept in the marine licensing system requires comprehensive regulatory reforms to ensure alignment between economic development and environmental conservation[2]. Juridical and practical obstacles in the implementation of sustainable development principles in marine licensing need to be systematically identified. At the juridical level, in addition to regulatory fragmentation, there are still various forms of norm conflicts that make implementation difficult, such as inconsistency between the Marine Law and the Regional Government Law regarding licensing authority in marine areas, or the unclear hierarchy of regulations when there is a conflict of interest between resource exploitation and conservation. The legal vacuum is also seen in the absence of regulations that specifically regulate the benefit-sharing of the use of marine genetic resources and the protection of marine biodiversity outside the conservation area. On a practical level, limited institutional capacity, weak inter-agency coordination, and lack of community participation in the licensing process are challenges. To overcome these problems, an ideal model for the regulation of marine resource exploration and exploitation licensing is needed, which can support the implementation of the Blue Economy concept in Indonesia. The model should consider an integrated approach to marine area management (Integrated Coastal and Ocean Management), the use of technology in monitoring and enforcement, and participation mechanisms involving various stakeholders including coastal communities. Several countries have shown success in implementing this integrated approach, such as Australia with the Great Barrier Reef Marine Park Authority which integrates various permits in coral reef areas, Norway with the Marine Spatial Planning System which harmonizes various activities in marine areas, and the Philippines with the Integrated Coastal Resource Management Project which emphasizes community participation in coastal resource management[3].

This research is important and urgent given the rapid rate of exploitation of marine resources in Indonesia and increasing global awareness of the importance of sustainable marine management. In the context of contributing to the science of law, this research will enrich the study of Indonesian maritime law by integrating perspectives from environmental law, administrative law, and economic law to create a comprehensive analytical framework related to marine resource licensing. Practically, this research can be a reference for policymakers in formulating a more integrated and sustainable marine licensing system reform. Through a comprehensive analysis of the existing legal framework, identification of implementation barriers, and formulation of an ideal model for sustainable licensing, this research is expected to make a significant contribution to the development of marine policies that support the achievement of the Blue Economy goals in Indonesia. Integrating the principles of sustainable development in the marine licensing system will not only protect marine resources for future generations, but also open up new economic opportunities through innovation and more efficient and responsible use of resources.

[2] Meg R. Keen, Anne-Maree Schwarz, and Lysa Wini-Simeon, "Towards Defining the Blue Economy: Practical Lessons from Pacific Ocean Governance," *Marine Policy* 88 (February 2018): 333–41,

https://doi.org/10.1016/j.marpol.2017.03.002.

[3] Tom Tietenberg and Lynne Lewis, *Environmental and Natural Resource Economics*, 12th ed. (New York: Routledge, 2023), https://doi.org/10.4324/9781003213734.

2. RESEARCH METHODS

This study uses a socio-legal approach that integrates legal doctrinal analysis with empirical investigation to understand the implementation of sustainable development principles in marine licensing. Data collection is carried out through two main strategies: first, the search for primary legal materials (national laws and regulations such as Law No. 32/2014 on Marine Affairs, Law No. 45/2009 on Fisheries, and international legal instruments such as UNCLOS and CBD), secondary legal materials (scientific journals, books, research reports), and tertiary legal materials (legal dictionaries, encyclopedias); second, field data collection was carried out at three research locations (Anambas, Bintan, and Bangka Islands) through in-depth interviews with 45 informants consisting of licensing regulators, business actors, and coastal communities, complemented by non-participatory observations of licensing practices and their impact on the environment and society. The research instrument in the form of interview guidelines was prepared based on indicators of sustainable development principles and Blue Economy derived from theoretical frameworks and regulatory analysis.

Data processing and analysis uses source triangulation methods and methods to ensure the validity of findings. Legal data were analyzed using grammatical, systematic, and teleological interpretation methods to identify norm conflicts and legal gaps in the licensing system, while empirical data were analyzed through thematic coding and categorization processes with the help of NVivo 14 software to identify implementation patterns and obstacles in the field. A comparative approach is also applied by examining best practices from Australia, Norway, and the Philippines as a reference in formulating an ideal model for sustainable marine licensing for Indonesia. The results of the analysis are presented qualitative-descriptive by combining juridical-normative perspectives and empirical realities to formulate contextual and applicable policy recommendations.

3. RESULTS AND DISCUSSION

3.1 Regulatory Framework for Marine Resources Licensing in Indonesia

An analysis of the regulatory framework for the exploration and exploitation of marine resources in Indonesia reveals significant fragmentation. There are at least 12 sectoral laws that regulate different aspects of the use of marine resources, with 8 ministries/institutions having authority related to licensing. This fragmentation creates a pronounced overlap of authority between the Ministry of Maritime Affairs and Fisheries, the Ministry of Energy and Mineral Resources, the Ministry of Environment and Forestry, and local governments. Documentation studies show that Law No. 32/2014 on Marine Affairs, which is supposed to be the main legal umbrella in the management of marine resources, has not been effective due to unclarity in the regulatory hierarchy when dealing with other sectoral laws.

An interesting finding from this study is the inconsistency in integrating sustainable development principles into various licensing regulations. An analysis of 27 marine licensing regulations shows that only 42% explicitly integrate sustainability principles as a substantive requirement in the licensing process. Law No. 32/2014 on Marine Affairs and Law No. 27/2007 jo. Law No. 1/2014 on the Management of Coastal Areas and Small Islands have indeed included sustainability principles, but their implementation in technical regulations related to licensing is still weak. Significant legal gaps are found in the benefit-sharing aspects of the utilization of marine genetic resources, cumulative impact assessments, and environmental compensation mechanisms in the licensing of exploration and exploitation of marine resources.

3.2 Implementation of Sustainable Development Principles in Licensing Practices

Field research at three study sites revealed a substantial gap between the regulation and implementation of sustainable development principles in licensing practices. In the Anambas Islands, interviews with offshore oil mining business actors revealed that although AMDAL is a key requirement in licensing, post-permit monitoring is very minimal with only 2 out of 7 companies consistently reporting the implementation of environmental management plans. Field observations confirmed the existence of poorly managed environmental impacts, including unreported small-scale oil pollution. Meanwhile, in Bintan, a study of 12 marine tourism business licenses found that the carrying capacity aspect of the ecosystem is rarely a substantive consideration in the licensing process, with 75% of respondents from regulators acknowledging limited capacity in assessing the

ecological sustainability of tourism businesses.

The findings in Bangka provide the most worrying picture, with sea sand mining activities that have caused damage to 700 hectares of coral reefs. Based on interviews with coastal communities, it was revealed that the licensing process for sea sand mining often does not involve adequate public consultation, with 78% of community respondents stating that they have never been involved in the decision-making process. Analysis of the EIA documents for 5 sea sand mining permits in Bangka shows that impact assessments tend to be fragmented and do not take into account cumulative effects on the overall coastal ecosystem. This weakness is further exacerbated by the absence of a formal coordination mechanism between agencies in the licensing and supervision process.

3.3 Obstacles in the Implementation of Sustainable Development Principles

The identification of obstacles in the implementation of sustainable development principles shows the existence of interrelated juridical and non-juridical factors. The main juridical obstacle lies in the conflict of norms between Law No. 32/2014 on Marine Affairs and Law No. 23/2014 on Regional Government regarding licensing authority in marine areas. Unclear in the division of authority causes overlap in licensing and supervision. A comparative analysis of 27 regulations related to marine licensing revealed that there are 34 conflicting provisions, especially in terms of sustainability criteria and environmental impact assessment procedures. Another juridical obstacle is the absence of a comprehensive implementing regulation for Law No. 32/2014, particularly related to the integration of sustainable development principles in cross-sector licensing.

Meanwhile, non-juridical barriers include limited institutional capacity, weak inter-agency coordination, and lack of public participation. Interviews with 15 employees of licensing agencies revealed that only 27% have a comprehensive understanding of the principles of sustainable development and their implementation in licensing. This limited human resource is exacerbated by the lack of budget for post-permit monitoring, with the ratio of supervisory officers to the number of permits issued reaching 1:43 in the Anambas Islands and 1:37 in Bangka. Coordination between institutions is also a significant obstacle, as reflected in the absence of an integrated information system that allows data sharing between agencies related to marine licensing. Public participation is also still a formality, with public consultation in the EIA process often carried out simply to meet procedural requirements.

3.4 Global Best Practices in Sustainable Marine Licensing

A comparative analysis of best practices from the three benchmark countries provides valuable insights for the development of a sustainable marine licensing model in Indonesia. Australia, through the Great Barrier Reef Marine Park Authority, has successfully developed an integrated licensing system with clear zoning based on the ecological value and carrying capacity of the ecosystem. The system is supported by a comprehensive environmental impact assessment process that considers the cumulative effects of various activities. The key to the success of the Australian model lies in the existence of a single authority that coordinates all licensing in coral reef areas, supported by a clear and consistent legal framework[4].

Norway offers a different model through the Marine Spatial Planning System that integrates marine licensing in comprehensive marine spatial planning. An innovative aspect of Norway's approach is the use of advanced information technology for post-permit compliance monitoring, including satellite-based vessel monitoring systems and open data platforms that enable transparency in the management of marine resources. In addition, Norway has developed a benefit-sharing mechanism that ensures the distribution of economic benefits from the exploitation of marine resources to local communities through special regional development funds.

The Philippines, through the Integrated Coastal Resource Management Project, offers a model that is more relevant to Indonesia's socio-economic context. This program successfully integrates local knowledge and community participation in the licensing and management process of coastal resources. The Philippines has developed a co-management system that engages coastal communities in monitoring and enforcement of licensing regulations, which has proven effective in reducing unsustainable resource utilization activities. This bottom-up approach is supported by a national legal framework that recognizes coastal communities' traditional rights to marine resources and their role in their management.

[4] Christy Juteau et al., "The Beauty underneath: A Critical Coastal Governance Approach to Revitalize Indigenous Shellfish Harvest," *Marine Policy* 174 (April 2025): 106590, https://doi.org/10.1016/j.marpol.2025.106590.

3.5 Ideal Model for Sustainable Marine Resources Exploration and Exploitation Licensing for Indonesia

Based on a comprehensive analysis of existing conditions and global best practices, this study proposes an ideal model of sustainable marine resource exploration and exploitation licensing for Indonesia consisting of five main components[5]. First, reform of the regulatory framework through the strengthening of Law No. 32/2014 as a legal umbrella by developing comprehensive implementing regulations and harmonizing sectoral laws. Second, the development of a spatial-based integrated licensing system that combines Marine Spatial Planning with zoning based on ecosystem carrying capacity and conservation value, similar to the Australian and Norwegian models but adapted to the Indonesian context.

The third component is the strengthening of the environmental impact assessment mechanism that considers cumulative effects and synergies with economic instruments, such as payment for ecosystem services and environmental bonds as a guarantee of compliance with environmental requirements[6]. Fourth, the development of an integrated licensing information system that connects all relevant agencies and is accessible to the public to increase transparency and accountability. Finally, strengthening community participation in the entire licensing cycle through co-management and benefit-sharing mechanisms inspired by the Philippine model but adapted to the socio-cultural diversity of Indonesia's coastal communities.

This model emphasizes an adaptive approach in the management of marine resources by taking into account ecosystem dynamics and the uncertainty of climate change. The integration of sustainable development principles in marine licensing is not just a procedural requirement, but a paradigm transformation that views sustainability as a fundamental prerequisite for long-term economic growth[7]. The implementation of this model will require strengthening institutional capacity, inter-institutional coordination, and strong political commitment, but it can pave the way for the creation of a Blue Economy that balances economic growth, social justice, and environmental sustainability[8].

3.6 Implications for the Development of the Blue Economy Concept in Indonesia

This research reveals important implications for the development of the Blue Economy concept in Indonesia. The transformation of the marine licensing system is a critical prerequisite for realizing the Blue Economy vision that balances the three pillars of sustainability: economic, social, and environmental. An analysis of the economic potential of implementing a sustainable licensing model shows that despite the additional costs of compliance in the short term, the long-term benefits are significant with an estimated increase in the economic value of marine resources of up to 30% in 10 years through sustainable use and the development of a high-value-added marine industry.

From a social perspective, the implementation of a licensing model that integrates the principles of justice and community participation has the potential to reduce resource utilization conflicts that often occur between large-scale businesses and traditional fishers. Interviews with 15 coastal community representatives revealed a strong aspiration to be substantively involved in the licensing process and get their fair share of the benefits of exploiting marine resources. The co-management and benefit-sharing system proposed in the ideal model can answer these aspirations while strengthening the role of communities as the vanguard in the conservation of coastal ecosystems[9].

[5] Nader AlKathiri et al., "Optimal Policies for Managing Oil Revenue Stabilization Funds: An Illustration Using Saudi Arabia," *Resources Policy* 67 (August 2020): 101686, https://doi.org/10.1016/j.resourpol.2020.101686.

[6] Na Zhou et al., "Evaluation of Chinese Natural Gas Investment along the Belt and Road Initiative Using Super Slacks-Based Measurement of Efficiency Method," *Resources Policy* 67 (August 2020): 101668, https://doi.org/10.1016/j.resourpol.2020.101668.

[7] Matthew N. Reimer, Anthony Rogers, and James N. Sanchirico, "Managing for Adaptive Capacity in Climate-Ready Fisheries," *Marine Policy* 174 (April 2025): 106601, https://doi.org/10.1016/j.marpol.2025.106601.

[8] Reimer, Rogers, and Sanchirico.

[9] Mariana Caldeira, Alumita Talei Sekinairai, and Marjo Vierros, "Weaving Science and Traditional Knowledge: Toward Sustainable Solutions for Ocean Management," *Marine Policy* 174 (April 2025): 106591, https://doi.org/10.1016/j.marpol.2025.106591.

From an environmental perspective, the sustainable licensing model has the potential to reverse the alarming trend of degradation of marine ecosystems[10]. Analysis using the Sustainable Development Governance Framework approach shows that the transformation of the licensing system can be a catalyst for a paradigm shift in marine resource management, from short-term exploitation to sustainable utilization. The successful implementation of this model will depend on the ability to integrate sustainability principles into the entire policy cycle, from planning to evaluation, as well as build the capacity of all stakeholders to operationalize those principles in the specific context of each marine sector.

4. CONCLUSION

Based on the results of research and discussion on the implementation of sustainable development principles in the licensing of exploration and exploitation of marine resources in Indonesia, several conclusions can be drawn as follows:

1. The regulatory framework for marine resource licensing in Indonesia has experienced significant fragmentation with at least 12 sectoral laws and 8 ministries/institutions having licensing authority. Law No. 32/2014 on Maritime Affairs, which was supposed to be the main legal umbrella, has not been effective due to the unclear hierarchy of regulations when dealing with other sectoral laws. Only 42% of marine licensing-related regulations explicitly integrate sustainability principles as a substantive requirement, demonstrating inconsistencies in integrating sustainable development principles.
2. The implementation of sustainable development principles in licensing practices at the three research sites shows a substantial gap between regulation and practice in the field. In the Anambas Islands, post-permit monitoring is very minimal with only 2 out of 7 companies consistently reporting on the implementation of environmental management plans. In Bintan, 75% of respondents from regulators acknowledged the limited capacity in assessing the ecological sustainability of tourism businesses. Meanwhile, in Bangka, sea sand mining activities have caused damage to 700 hectares of coral reefs with 78% of community respondents stating that they have never been involved in the licensing decision-making process.
3. Obstacles in the implementation of sustainable development principles include interrelated juridical and non-juridical factors. The main juridical obstacle lies in the conflict of norms between Law No. 32/2014 on Marine Affairs and Law No. 23/2014 on Regional Government related to licensing authority, with 34 conflicting provisions among 27 related regulations. Non-juridical barriers include limited institutional capacity with only 27% of licensing agency employees having a comprehensive understanding of the principles of sustainable development, the ratio of supervisory officers to the number of permits reaching 1:43 in the Anambas Islands and 1:37 in Bangka, as well as the absence of an integrated information system for data sharing between agencies.
4. An analysis of global best practices from Australia, Norway, and the Philippines shows different approaches that can be adapted to the Indonesian context. Australia through the Great Barrier Reef Marine Park Authority offers an integrated licensing model with a single authority and zoning based on ecological value. Norway's Marine Spatial Planning System integrates licensing in marine spatial planning with the support of advanced technology for monitoring. The Philippines through the Integrated Coastal Resource Management Project implements a co-management approach that involves coastal communities in the licensing and resource management process.
5. The ideal model of sustainable marine resource exploration and exploitation licensing for Indonesia consists of five main components: reform of the regulatory framework by strengthening Law No. 32/2014 as a legal umbrella, developing a spatially-based integrated licensing system, strengthening an environmental impact assessment mechanism that considers cumulative effects, developing an integrated licensing information system, and strengthening community participation in the entire licensing cycle through mechanisms co-management and benefit sharing.
6. The transformation of the marine licensing system is a critical prerequisite for realizing the vision of the Blue Economy in Indonesia. The implementation of the sustainable licensing model has

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[10] Laura L. Griffiths, Rod M. Connolly, and Christopher J. Brown, "Critical Gaps in Seagrass Protection Reveal the Need to Address Multiple Pressures and Cumulative Impacts," *Ocean & Coastal Management* 183 (January 2020): 104946, https://doi.org/10.1016/j.ocecoaman.2019.104946.

potential to increase the economic value of marine resources by up to 30% in 10 years, reduce resource utilization conflicts between large-scale businesses and traditional fishers, and reverse the trend of degradation of marine ecosystems. The successful implementation of this model depends on integrating sustainability principles into the entire policy cycle and strengthening the capacity of all stakeholders.

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