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Strengthening ship mortgage governance for sustainable people's shipping and blue economy

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Abstract

This study analyses the weaknesses of debtor protection in ship mortgage credit agreements within Indonesia's people's shipping sector and proposes a justice-based reconstruction aligned with sustainable blue economy principles. People's shipping, which relies heavily on small- and medium-sized vessel owners, requires fair and predictable financing mechanisms to support maritime livelihoods. However, inconsistencies across the Civil Code, the Commercial Code, and the Shipping Law create legal uncertainty and weaken debtor protection, especially in mortgage execution procedures affecting small-scale shipowners. Using a constructivist paradigm and a juridical-sociological method, this study examines statutory regulations alongside banking practices, auction mechanisms, and ship mortgage enforcement. The findings reveal weaknesses in legal substance, structure, and culture, including unclear execution norms, administrative delays, challenges with vessel mobility, and high enforcement costs that disproportionately burden people's shipping actors. These regulatory gaps hinder equitable access to credit and disrupt the economic continuity of small maritime communities, thereby limiting the contribution of people's shipping to a sustainable blue economy. The study recommends reconstructing key legal provisions to strengthen proportional rights and obligations, improve legal certainty, and support responsible ship financing that empowers coastal communities and promotes the long-term sustainability of Indonesia's maritime economy.

Keywords

Blue economy, Debtor protection, Ship mortgage, Sustainable maritime financing

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Introduction

The blue economy has become a vital focus in global sustainable development policy, aligning with the Sustainable Development Goals (SDGs), particularly SDG 14 on Life Below Water, and the commitments of the Paris Agreement on climate change mitigation [1]. The blue economy is defined as the sustainable use of marine and coastal resources for economic growth while safeguarding marine ecosystems [2, 2,3]. As the world' s largest archipelagic nation, Indonesia plays a key role in the global blue economy [4]. With 17, 508 islands and a marine area of about 6. 4 million square kilometres, which account for 65% of its total territory, Indonesia bears a significant

responsibility for the sustainable management of marine resources [5]. Indonesia has 2, 439 ports, most of which are community- based (*traditional)* ports serving the maritime transportation needs of coastal communities [6, 7]. Traditional shipping *(pelayaran rakyat*) forms the backbone of the local maritime economy, connecting remote islands, supporting logistics distribution, and providing livelihoods for millions of coastal residents [8]. However, this sector faces serious challenges threatening its operational sustainability and its capacity to contribute to meeting sustainable development targets. A major issue in community ports is environmental degradation caused by marine debris, vessel- generated waste, and domestic waste from coastal communities, which has worsened over time [9]. The limited integration of social justice into marine environmental initiatives has created a gap between corporate responsibility rhetoric and actual community engagement practices [10]. Research by Maruf et al. (2025) reveals a significant gap between corporate environmental commitments and effective implementation of socio- environmental governance, highlighting the need for multi-stakeholder coordination [11]. The study further emphasises that governance barriers, rather than merely technical challenges, are the main obstacles to green port transformation [12].

The financing trap that entangles fishers in informal debt cycles [13,14] highlights the urgency of developing inclusive formal financing options [15]. However, there is currently no legal framework that accounts for the unique features of the traditional maritime sector. In May 2023, Indonesia issued a sovereign blue bond worth JPY 20.7 billion (USD 150 million) to fund ocean-based projects, including coastal protection, sustainable fisheries, and mangrove restoration [16,17]. A notable gap remains due to the lack of domestic regulations governing the allocation of these funds to community ports and traditional shipping, creating a legal void in Indonesia's financing instruments for the blue economy [18,19]. Conversely, China's Hainan Province has utilised proceeds from blue bonds to support sustainable shipping and port logistics [16]. Indonesia, however, has yet to establish a framework connecting blue bond instruments with the financing needs of traditional shipping.

A regulatory sandbox is an innovative testing mechanism that has been successfully used in the fintech sector [7]. However, it has not yet been applied to blue economy financing, particularly for traditional shipping. This research aims to design a blue economy–based financing model tested through a regulatory sandbox by incorporating blue bonds, government subsidies, guarantee schemes, and community participation to improve financing for environmentally friendly vessels and the development of green community ports. Previous studies include Purnamasari et al. (2022), who examined vessel registration procedures within Indonesia's legal framework of ship mortgages; Wijaya and Fauzie (2020), who analysed credit access barriers faced by small-scale fishermen; and Hidayat et al. (2024), who discussed financing mechanisms for maritime investment. Internationally, Morchio et al. (2025) investigated green maritime financing instruments, Endarto et al. (2025) explored the regulatory framework for blue bond

issuance, and Vakili et al. (2025) analysed legal pathways for decarbonising short-haul shipping. Nonetheless, no existing study has specifically examined ship mortgage governance as a structural obstacle to fair access to credit for maritime actors, nor has it proposed a justice-focused legal reform of mortgage norms within a blue economy framework. This study addresses this gap by combining a normative analysis of institutional governance barriers with empirical field data from ports in West Java to suggest a reconstruction of debtor protection norms aligned with Indonesia's commitments to sustainable maritime development.

Based on this background, the research problems are formulated as follows:

1. How can small-scale fishers and traditional shipping actors access formal financing to support the transition to green ports and sustainable shipping based on the blue economy?
2. How can an inclusive and practical blue economy–based financing model improve access to funding for the purchase of environmentally friendly traditional vessels and the development of community projects ports?

Method

This research adopts a constructivist paradigm, which views law as an interpretive system that is socially embedded and both influences and is influenced by the economic realities and governance within the maritime sector. The research approach is juridical-sociological, combining normative analysis of the legal framework with empirical observations of how legal norms function in practice within the community's shipping environment. Secondary sources include academic journals on maritime law, blue economy governance, and ship mortgage regulation, along with policy documents from Indonesia and comparative maritime jurisdictions. Primary data were collected through semi-structured interviews conducted at two community ports in West Java, namely Pangandaran and Cirebon. Three key informants were purposively selected for their relevant roles and direct experience. The interviews focused on three main themes: regulation and access to formal financing for smallholder fishers, collateral constraints and business risks, and inclusive financing models grounded in blue economy principles.

Results and discussion

The limits of formal financing access in Indonesia's blue economy transition

While Indonesia has formally adopted the blue economy paradigm and introduced blue finance instruments at the sovereign level, the absence of legally defined blue project classifications, technical eligibility standards, and disbursement pathways effectively disconnects these instruments from small-scale maritime actors [1,2]. Consequently, blue bonds mainly serve as symbolic commitments to sustainability without resulting in genuine financial access for traditional shipping or community-based ports. This gap underscores a broader governance failure where policy ambitions surpass regulatory

capacity and institutional coordination. The article implicitly frames this financing gap within the context of market failure, suggesting that reliance solely on market-driven lending mechanisms cannot resolve exclusion in the maritime grassroots sector. Small-scale fishers and traditional shipping operators operate in environments characterised by seasonal income, informal assets, and limited collateral, making them structurally incompatible with private risk assessment models [3,4]. In this context, the article advocates for state-mediated financing instruments, particularly sovereign blue bonds, to address systemic exclusion by absorbing or redistributing risks the private sector is reluctant to undertake. This shifts the focus from individual financial behaviour to public policy intervention.

A comparative analysis further supports this argument by demonstrating that other jurisdictions have successfully integrated blue bond proceeds into the maritime sector, including sustainable shipping and port logistics. Examples from Seychelles, Belize, Barbados, Hainan Province in China, and the Philippines show that blue finance instruments can sustain operational maritime activities if supported by clear regulatory guidelines and project eligibility criteria [17,18]. These cases reveal that Indonesia's challenge is not a lack of viable financing models but rather the absence of domestic legal and institutional mechanisms necessary to adapt global best practices into locally suitable solutions. Despite these insights, the article also highlights the limitations of Indonesia's current blue finance framework, stopping short of proposing a practical model linking macro-level financing instruments with micro-level maritime needs. The discussion remains predominantly at the policy and legal level, without detailing how government channels sovereign blue bond proceeds through traditional vessels, community ports, or small-scale operators [16]. This gap is significant given the recognition of governance barriers as the primary obstacle to transforming green ports and sustainable shipping. Empirical field findings from port authorities and active fishers confirm that the structural nature of the financing gap in Indonesia's blue economy transition is pervasive across three interconnected levels. At the regulatory level, the absence of rules requiring banks to accept vessels under 100 GT as collateral, and the lack of a maritime insurance ecosystem for small vessels, make the ship mortgage instrument unusable, forcing fishers to use land title certificates as collateral instead of their primary assets.

At the institutional level, facilitation mechanisms like the Fisher Financing Corner programme proved unsustainable without ongoing support from the central government. Simultaneously, Ministry of Marine Affairs and Fisheries financing schemes with sustainability requirements remain disconnected from sovereign blue bond instruments, indicating that Indonesia's blue finance architecture has yet to translate macro-level policy commitments into accessible micro-level financing options. At the legal culture level, inconsistent enforcement of fish auction market regulations results in fishers' business cash flows being undocumented and unverifiable, systematically hindering banks' capacity to assess creditworthiness based on actual business

performance rather than fixed assets. Collectively, these findings show that the financing challenge faced by traditional shipping operators stems not from low productivity or limited economic contribution but from regulatory, institutional, and enforcement shortcomings that perpetuate financial exclusion, regardless of individual fisher behaviour or environmental compliance.

Designing an inclusive blue economy financing model for traditional shipping and community ports

Building on the identification of structural and regulatory barriers to access to formal financing, an inclusive blue economy financing model is implicitly advanced as necessary, one that moves beyond conventional market-based lending frameworks. Inclusivity in this context refers not simply to broader participation, but to the deliberate adaptation of financial instruments to the socio-economic characteristics of small-scale fishers and traditional shipping operators. These actors function within highly seasonal income structures, limited asset formalisation, and strong community embeddedness, all of which require financing models that are flexible, risk-sharing, and institutionally supported [16]. Sovereign blue bonds offer a mechanism for pooling large-scale capital, embed environmental and social objectives into use-of-proceeds frameworks, and, by leveraging state credibility, reduce financing costs and mitigate risk perceptions that typically exclude grassroots maritime actors from formal credit markets [9]. However, the inclusivity of blue bonds is not inherent but contingent on downstream allocation mechanisms that deliberately target traditional shipping and community-based ports.

Comparative experiences from other jurisdictions confirm that inclusive blue financing requires explicit regulatory design. In Hainan Province, China, blue bond proceeds are directed not only toward marine conservation but also to sustainable shipping and port logistics through clearly defined eligibility criteria and sectoral prioritisation [17,18]. The Philippine model similarly incorporates technical guidelines identifying eligible blue projects and activities, enabling both public and private issuers to channel financing toward operational maritime infrastructure [18,19]. These cases demonstrate that inclusivity is achieved through regulatory clarity, not financial innovation alone.

The Indonesian case exposes a critical gap between the availability of blue finance at the macro level and the financing needs of traditional maritime actors at the micro level. Although sovereign blue bonds have been issued, the absence of legal definitions, technical standards, and project taxonomies restricts their capacity to support environmentally friendly vessels or the modernisation of community ports [12]. This regulatory ambiguity not only constrains access but also increases the risk of blue-washing, which undermines the credibility of blue finance as a sustainable development instrument.

An inclusive blue economy financing model, therefore, requires an integrated architecture that combines multiple instruments rather than relying on a single funding source. While blue bonds serve as the primary mechanism for mobilising capital, their

effectiveness depends on complementary components, including government subsidies, credit guarantees, and community-based financing structures [13]. Subsidies address affordability constraints for small-scale operators, guarantee schemes absorb credit risk that deters commercial lenders, and community participation enhances accountability while ensuring that financing aligns with local environmental and socio-economic priorities.

From a legal and policy perspective, the feasibility of such an integrated model is reinforced by Indonesia's constitutional commitment to sustainable and environmentally sound economic development. Articles 28H and 33 of the 1945 Constitution provide a normative basis for state intervention in financing mechanisms that promote environmental protection and social equity [7], positioning inclusive blue economy financing as a constitutional instrument for implementing sustainable maritime governance rather than merely a financial strategy.

Empirical data confirm that formal financing constraints for traditional shipping operators originate from three mutually reinforcing layers. At the regulatory layer, no norm obliges banks to accept vessels under 100 GT as collateral equivalent to fixed assets, and the absence of a maritime insurance ecosystem for small fishing vessels renders the ship mortgage instrument operationally ineffective. At the institutional layer, facilitation mechanisms such as the Fisher Financing Corner programme are ad hoc and contingent on central government initiatives that may be discontinued. At the same time, Ministry of Marine Affairs and Fisheries financing schemes requiring sustainability compliance remain disconnected from sovereign blue bond instruments at the macro level. At the legal culture layer, income uncertainty driven by fluctuating fish resources and the practice of selling catch outside official fish auction markets leaves fishers' business cash flows undocumented, depriving banks of an adequate basis for assessing creditworthiness. The cumulative effect of these three layers is that fishers can access formal credit only by substituting fixed assets, such as land or buildings, as collateral, rather than relying on their vessel as the primary productive asset of their livelihood. While the normative and comparative justification for inclusive blue financing is well established, it remains unclear how risk-sharing arrangements, eligibility criteria, and fund allocation processes are operationalised in the Indonesian context. This limitation underscores the need for applied policy instruments that can test and institutionalise inclusive financing models in real-world conditions. The design of inclusive blue economy financing is therefore best understood as an iterative and adaptive process, requiring mechanisms that allow regulatory experimentation while maintaining legal oversight and public accountability, a function that regulatory sandbox approaches are particularly suited to fulfil as controlled environments for piloting integrated blue financing schemes tailored to traditional shipping and community ports

The United Nations Sustainable Development Goals and the issuance of blue bonds are normatively aligned, particularly with SDG 14 on Life Below Water, which emphasises

the conservation and sustainable use of oceans, seas, and marine resources for sustainable development. This alignment positions blue bonds not merely as financial instruments but as policy tools for operationalising global sustainability commitments within national development frameworks. In the Indonesian context, the integration of the SDGs into domestic governance has been formally institutionalised through Presidential Regulation No. 59 of 2017, which provides the legal basis for implementing the 2030 Agenda for Sustainable Development at the national level. Indonesia's commitment to this framework reflects its active role as a United Nations member state in translating global development targets into domestic obligations, as articulated in the document Transforming Our World: The 2030 Agenda for Sustainable Development. Accordingly, blue bond issuance in Indonesia should be interpreted as part of a broader legal and policy obligation to convert international sustainability commitments into concrete financial and regulatory mechanisms. From this perspective, the effectiveness of blue bonds is measured not only by their capacity to mobilise capital but also by their substantive contribution to SDG 14 outcomes, including sustainable fisheries, environmentally sound maritime transport, and the protection of marine ecosystems.

Conclusion

The first discussion demonstrates that limited access to formal financing for small-scale fishers and traditional shipping actors in Indonesia is fundamentally rooted in structural, regulatory, and institutional constraints rather than individual economic incapacity. Income volatility, asset informality, and heightened exposure to external shocks—exemplified by the COVID-19 pandemic—have reinforced risk perceptions within conventional financial systems, thereby systematically excluding grassroots maritime actors from formal credit. This exclusion is further exacerbated by the absence of a coherent legal framework that connects sovereign-level blue finance instruments with the operational realities of community ports and traditional shipping. Consequently, access to finance in the blue economy context must be understood as a governance and policy challenge that requires state intervention grounded in constitutional mandates for sustainable and equitable development.

The second discussion concludes that designing an inclusive blue economy financing model necessitates an integrated and state-mediated approach that combines sovereign blue bonds with clear regulatory standards, downstream allocation mechanisms, and complementary risk-sharing instruments. While blue bonds are normatively aligned with SDG 14 and Indonesia's commitments under the 2030 Agenda for Sustainable Development, their inclusivity depends on the existence of legal definitions, technical eligibility criteria, and institutional arrangements that channel funds to environmentally friendly vessels and community-based ports. The absence of such operational frameworks underscores the need for adaptive policy instruments, such as regulatory sandboxes, to test and institutionalise inclusive blue finance models

that effectively translate global sustainability commitments into tangible benefits for traditional maritime sectors.

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