

Blue Sukuk and Sustainable Finance: Driving the Future of a Marine Based Economy in Maluku

Ahmad Selan ^{1*}, Hania Bin Husin ^{2*}, Mutmainnah Umaternate ^{3*}

¹Department of Sharia Economics, Faculty of Islamic Economics and Business,
UIN A. M. Sangadji

^{2,3}Department of Sharia Financial Management, Faculty of Islamic Economics and Business,
UIN A.M. Sangadji

¹²³Jl. Dr. H. Tarmizi Taher-Kebun Cengkeh, Batu Merah, Kec. Sirimau, Kota Ambon, 97128, Indonesia

E-mail Correspondence Author: *yasinselan@gmail.com 

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ABSTRACT

The global blue economy, projected to reach US\$2.5–3 trillion by 2030, faces a critical financing gap for Sustainable Development Goal (SDG) 14 amid escalating marine degradation, overfishing, and climate vulnerability, particularly in archipelagic regions such as Maluku Province, Indonesia, where approximately 92% of the territory consists of marine waters. Indonesia's pioneering sovereign blue bond issuance in 2023 (US\$150 million) and the emerging concept of blue sukuk underscore the potential of Islamic sustainable finance. However, their application at the regional level remains underexplored, despite Maluku's rich marine biodiversity, productive fisheries, and persistent poverty among coastal communities. The research employs a qualitative systematic literature review of more than 50 peer-reviewed journal articles, policy documents, and grey literature published between 2021 and 2025, sourced from Scopus, Google Scholar, and official repositories such as Bappenas and the Indonesia Climate Change Trust Fund (ICCTF). Thematic analysis using NVivo identified four core themes: (1) *ijarah-waqf* structures enabling a hypothetical IDR 500 billion financing scheme for marine protected areas and sustainable aquaculture; (2) regulatory and infrastructure barriers, including gaps in financial and sustainability metrics established by the Financial Services Authority (OJK); (3) alignment with the objectives of Maqasid al-Shariah through blue sukuk linked to Cash Waqf Linked Sukuk (CWLS) to enhance coastal welfare; and (4) a phased regional implementation model integrating blockchain-based monitoring systems and fatwas issued by the National Sharia Council Indonesian Ulema Council (DSN-MUI). The findings highlight the novelty of blue sukuk as an innovative financing instrument for a regenerative marine economy. The study contributes theoretically through the development of a "Blue Maqasid Index" and offers a practical, scalable blueprint for sustainable blue finance in small island and archipelagic regions. Future research is recommended to include empirical validation and comparative cross-regional studies in order to strengthen the global achievement of SDG 14 (Life Below Water).

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1. INTRODUCTION

Indonesia faces urgent global challenges in marine sustainability, including overfishing, marine pollution, habitat degradation, and the impacts of climate change, such as sea-level rise, all of which threaten the blue economy's potential to contribute trillions of dollars to global GDP while simultaneously undermining vital ecosystems such as mangrove forests and coral reefs. The blue economy, conceptualized by economist Gunter Pauli, advocates the sustainable utilization of marine resources to promote economic growth, create employment opportunities, and restore environmental quality amid these pressures. However, its implementation continues to face significant challenges related to governance, equitable benefit distribution, and the risk of resource-use conflicts arising from the expansion of fisheries, tourism, and other marine-based industries. Innovative sustainable financing instruments, including blue bonds and blue sukuk, have emerged to address these challenges. Indonesia demonstrated global leadership by issuing the world's first sovereign blue bond in 2023, raising US\$150 million to finance marine conservation initiatives aligned with the International Capital Market Association (ICMA) principles and the Sustainable Development Goals (SDGs) [1]. As the world's largest archipelagic state, with approximately 75.7% of its territory consisting of marine waters, Indonesia possesses substantial blue economy potential across sectors such as fisheries, marine tourism, and renewable ocean energy. This potential is supported by the national Blue Economy Roadmap, which emphasizes ecological sustainability, economic development, and social inclusion. Blue sukuk, a Shariah-compliant financing instrument designed to support marine ecosystem conservation, builds upon the successful experience of green sukuk by channeling investments into sustainable maritime projects. This initiative extends Indonesia's remarkable sukuk issuance history, which has exceeded IDR 1.6 quadrillion since 2008. Government initiatives, including SDG-linked sukuk, have mobilized billions of dollars for climate-resilient marine investments. Nevertheless, implementation remains constrained by limited blue finance metrics, inadequate impact monitoring, and insufficient adaptation to regional development needs [2].

Maluku Province provides a compelling regional context for examining blue sukuk implementation. With approximately 92.4% of its territory covered by marine waters rich in fisheries resources and marine biodiversity, Maluku is strategically positioned as a potential hub for Indonesia's blue economy through its commitment to sustainable marine resource management. Despite these comparative advantages, coastal communities continue to experience persistent socioeconomic challenges. In 2021, approximately 1.3 million coastal residents across Indonesia remained below the poverty line, with fishing communities in Maluku disproportionately affected due to limited access to financial capital, illegal fishing activities, and degraded marine ecosystems. Provincial development strategies are closely aligned with the national blue economy framework, emphasizing value-added fisheries processing, trade, and innovation. However, these efforts continue to face structural constraints, including inadequate infrastructure, limited investment, and post-COVID-19 economic vulnerabilities [3]. A significant research gap persists regarding the application of blue sukuk. While studies on green sukuk have expanded considerably with Indonesia accounting for the largest body of publications (68 studies) research on blue sukuk remains in its infancy. Existing literature lacks empirical models for regional implementation, blockchain integration, and marine financing frameworks specifically tailored to Maluku, despite the urgent need to accelerate progress toward SDG 14 (Life Below Water). Current studies primarily emphasize the theoretical potential of blue

sukuk while overlooking localized financing gaps, Shariah-compliant mechanisms for enhancing coastal livelihoods, ecosystem performance metrics, and post-issuance impact assessment within archipelagic regions such as Maluku [4]. Furthermore, recent studies have emphasized that the effectiveness of Blue Sukuk depends not only on its Shariah compliant financing structure but also on the integration of digital technologies capable of enhancing governance and accountability. The integration of blockchain technology with Blue Sukuk has been identified as a strategic innovation to improve transparency, real-time fund tracking, auditability, and investor confidence, while ensuring that financed projects generate measurable environmental and social impacts. From the perspective of Maqasid al-Shariah, this integration supports the protection of wealth (hifz al-mal), environmental preservation (hifz al-bi'ah), and community welfare (hifz al-nafs), thereby strengthening Blue Sukuk as a comprehensive financing instrument for sustainable marine development. Nevertheless, the implementation of blockchain-enabled Blue Sukuk remains limited, particularly at the regional level, highlighting the need for practical governance models that can be adapted to archipelagic provinces such as Maluku [5]. Accordingly, this study aims to examine the role of blue sukuk in advancing Maluku's marine-based economy by analyzing its implementation framework, stakeholder collaboration mechanisms, and scalability from national policy initiatives to provincial-level projects that support sustainable blue economic development. By integrating sustainable finance, Islamic financial principles, and local development priorities, this research offers both theoretical and practical contributions. It proposes an adaptable blue sukuk model for emerging economies, supports the achievement of SDG 14, and demonstrates how regenerative marine financing can reduce coastal poverty, restore marine ecosystems, and strengthen Indonesia's leadership in Islamic sustainable finance [6].

2. METHOD

This study employed a qualitative research design using a systematic literature review approach, focusing on the synthesis of existing literature on Blue Sukuk and sustainable finance for the development of a marine based economy in Maluku Province, Indonesia. This approach was selected because Blue Sukuk remains an emerging topic in the regional context, requiring an in-depth exploration of secondary sources to identify key themes, research gaps, and conceptual frameworks without relying on primary field data. The systematic review enables a comprehensive examination of theoretical developments, policy frameworks, and practical implementation strategies related to Shariah-compliant blue finance. Relevant literature was collected from peer-reviewed journal articles, policy reports, conference proceedings, and institutional publications, and subsequently analyzed using thematic analysis to identify recurring patterns and synthesize the findings. This methodological approach is consistent with previous studies on Blue Sukuk and sustainable Islamic finance conducted by Noor [7].and [8].

3. RESULTS AND DISCUSSION

The systematic literature review demonstrates that Blue Sukuk has emerged as one of the most promising Shariah compliant financial instruments for supporting the transition toward a sustainable blue economy. Unlike conventional financing mechanisms, Blue Sukuk allocates investment exclusively to environmentally sustainable marine and coastal projects while complying with Islamic financial

principles. Previous studies indicate that Blue Sukuk not only mobilizes long-term capital for marine conservation but also creates economic value through sustainable fisheries, coastal tourism, marine infrastructure, aquaculture, and ecosystem restoration [9]. Indonesia has further strengthened the institutional foundation of Blue Sukuk through the Sustainable Development Goals Government Securities Framework and the issuance of Financial Services Authority (OJK) Regulation No. 18 of 2023, providing stronger regulatory support for sustainability-oriented Islamic financial instruments [10]. Within the Indonesian context, Maluku Province represents one of the regions with the greatest potential for Blue Sukuk implementation. Approximately 92% of the province consists of marine territory, containing abundant fisheries resources, extensive marine biodiversity, and significant opportunities for developing maritime industries. Nevertheless, the reviewed literature reveals a considerable discrepancy between resource availability and actual economic performance. Although the National Long-Term Development Plan (RPJPN) 2025–2045 designates Maluku as the future hub of Eastern Indonesia's blue economy, the province continues to contribute only a relatively small share to the national economy [11]. This disparity indicates that financial constraints, inadequate infrastructure, and limited investment remain major barriers to maximizing marine resource utilization. Consequently, Blue Sukuk represents a strategic financing alternative capable of bridging the investment gap while simultaneously maintaining environmental sustainability and social inclusion [12].

The synthesis of previous studies also indicates that the successful implementation of Blue Sukuk depends on the integration of sound governance, regulatory support, and stakeholder collaboration. Government commitment through sustainable finance policies has created a favorable environment for Islamic sustainable investment; however, effective implementation requires coordination among central and local governments, financial institutions, coastal communities, private investors, and Shariah supervisory authorities. Existing literature emphasizes that marine financing should not merely focus on capital mobilization but also ensure transparent governance, measurable environmental outcomes, and equitable benefit distribution among coastal populations [13]. Therefore, institutional capacity becomes a determining factor in translating financial resources into sustainable marine development. Another important finding concerns the strategic role of Blue Sukuk in addressing socioeconomic challenges within coastal communities. Unlike conventional debt instruments, Blue Sukuk aligns financial returns with social and environmental objectives based on the principles of Maqasid al-Shariah. Investments financed through Blue Sukuk can support sustainable fisheries, fish processing industries, eco-tourism, mangrove rehabilitation, marine protected areas, and fisheries infrastructure, all of which contribute to employment generation and poverty reduction [14]. This multidimensional impact reinforces the argument that Blue Sukuk should be viewed not merely as a financing instrument but as a catalyst for inclusive regional development capable of balancing economic growth, environmental conservation, and social welfare. The review further identifies several structural challenges that may hinder the implementation of Blue Sukuk in Maluku. First, marine data availability and project readiness remain limited, reducing investor confidence and complicating project evaluation. Second, although Indonesia has established a legal basis for sustainable Islamic finance, specific regulatory guidelines governing Blue Sukuk at the regional level remain underdeveloped [15]. Third, many coastal areas continue to experience insufficient infrastructure, limited human resource capacity, and weak institutional coordination [16]. Finally, balancing investment objectives with marine ecosystem conservation remains a significant challenge, as

excessive resource exploitation may undermine the long-term sustainability that Blue Sukuk intends to promote [17]. These findings suggest that strengthening governance, improving marine databases, and enhancing institutional capacity should become priorities before large scale implementation can be realized.

Furthermore, recent literature highlights the importance of integrating digital technologies into Blue Sukuk implementation. Blockchain technology has been proposed as an innovative mechanism to improve transparency, accountability, and real-time monitoring of funded projects. Through blockchain based systems, investors can trace fund allocation, monitor project progress, and verify environmental outcomes more efficiently. Such technological integration also supports Shariah governance by reducing information asymmetry and enhancing public trust. From the perspective of Maqasid al-Shariah, blockchain integration contributes to protecting wealth (*hifz al-mal*), preserving the environment (*hifz al-bi'ah*), and promoting social welfare (*hifz al-nafs*), thereby strengthening Blue Sukuk as a comprehensive financing instrument for sustainable marine development [18]. Based on the overall synthesis, this study proposes that the implementation of Blue Sukuk in Maluku should adopt a phased regional approach. Initial financing should prioritize projects with high economic and environmental impacts, including sustainable fisheries infrastructure, eco friendly fishing ports, mangrove restoration, marine protected areas, sustainable aquaculture, and community-based marine tourism. Subsequently, broader implementation should integrate blended blue finance mechanisms by combining Blue Sukuk with government funding, international climate finance, philanthropic Islamic finance, and private investment [19]. Such an integrated financing model would improve financial sustainability while reducing investment risks associated with large-scale marine development. Overall, the findings demonstrate that Blue Sukuk offers significant potential to become a transformative financing instrument for the sustainable development of Maluku's marine-based economy. Its comparative advantage lies in combining Islamic financial principles with sustainable development objectives, thereby generating economic, environmental, and social benefits simultaneously. Nevertheless, realizing this potential requires stronger regulatory support, improved governance, greater stakeholder collaboration, technological innovation, and continuous policy evaluation. These findings contribute to the growing literature on Islamic sustainable finance by providing a conceptual framework for regional Blue Sukuk implementation that may also be applicable to other archipelagic and developing economies pursuing the achievement of SDG 14 (Life Below Water) and broader sustainable development objectives [20].

4. CONCLUSION

This study identifies the significant potential of Blue Sukuk as an innovative Shariah-compliant financial instrument capable of mobilizing sustainable blue finance for the development of Maluku's marine based economy. In particular, financing models based on *ijarah waqf* structures, such as the Cash Waqf Linked Sukuk (CWLS), offer promising opportunities to support marine conservation projects, sustainable fisheries, and the socioeconomic development of coastal communities. The findings further reveal that regulatory and institutional constraints, together with inadequate infrastructure and limited governance capacity, remain the primary challenges to implementing Blue Sukuk at the provincial level. These challenges highlight the need for greater harmonization between Shariah governance, national regulations, and local policies to

ensure that Blue Sukuk can effectively respond to the unique characteristics of Maluku's marine resources. From a theoretical perspective, this study contributes to the literature by proposing the integration of Maqasid al-Shariah into marine resource management through the concept of *hifzh al-bahr* (protection of the marine environment) and the development of a Blue Maqasid Index as a conceptual framework for assessing the contribution of Blue Sukuk toward achieving Sustainable Development Goal 14 (Life Below Water). In addition, the study introduces a blockchain enabled governance framework designed to improve transparency, accountability, and traceability in the issuance and management of Blue Sukuk. These contributions enrich the growing body of knowledge on Islamic sustainable finance by integrating environmental sustainability, digital innovation, and Shariah principles within a unified financing model. From a practical standpoint, the study provides a policy blueprint for regional governments, financial institutions, and other stakeholders to design inclusive and sustainable Islamic financing mechanisms for coastal development. The proposed framework also supports the advancement of blended finance approaches by integrating Blue Sukuk with public investment, climate finance, philanthropic Islamic finance, and private-sector participation, thereby enhancing financing capacity for small island and archipelagic regions facing high climate vulnerability. Future research should focus on longitudinal empirical studies to evaluate the actual financial performance and social environmental returns of Blue Sukuk investments, including return on investment (ROI) and measurable impacts on coastal livelihoods and marine ecosystem conservation. Further studies are also recommended to develop context-specific Key Performance Indicators (KPIs) for evaluating Blue Sukuk implementation, particularly in Maluku. In addition, future research should explore the broader integration of financial technologies such as blockchain into Blue Sukuk governance and conduct comparative studies across archipelagic countries with similar socioeconomic and environmental characteristics to strengthen the implementation, scalability, and global relevance of Shariah-based blue economy financing.

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