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Green Finance and Sustainable Banking Towards a Green Economy in Indonesia

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Abstract

Green finance and sustainable banking are increasingly becoming central pillars in the global financial system, particularly in supporting the transition toward sustainable development. This article examines global trends, the role of banking institutions, and the implementation of sustainable finance policies in Indonesia, with a specific focus on the practices of major banks such as Mandiri, BRI, and BNI. Although there has been a growing interest in green financial instruments, the proportion of green credit portfolios in Indonesia remains relatively small, constrained by limited fiscal incentives, the high cost of certification, and the low demand from business actors. This library research highlights the importance of integrating Environmental, Social, and Governance (ESG) principles, expanding innovative products such as green bonds and blended finance, and strengthening government regulatory support to enhance the green finance ecosystem. By combining global insights with local realities, the study underscores that the success of green banking in Indonesia critically depends on multi-stakeholder collaboration, enhanced financial literacy for businesses, and the proactive role of banks in mobilizing capital toward environmentally friendly projects.

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1. Introduction

As stated by Cunha et al. (2021), sustainable finance is viewed as a fundamental element in preparing the financial sector for a more resilient, green future. This statement shows that the concept of sustainability is not just an additional issue, but has entered the heart of modern financial practices. Globally, the green finance trend is rooted in the increasing attention of the international community to the principles of ESG (Environmental, Social, and Governance), which are now the standard for measuring company quality, including financial institutions. Fast-growing green financial instruments, such as green bonds, sustainable loans, and blended finance, are the main means of connecting the allocation of public and private capital with projects oriented towards environmental sustainability (Park & Kim, 2020). With these instruments, investors gain portfolio diversification opportunities, while green projects receive stable and long-term funding support.

In the context of banking, sustainable banking has a strategic role that goes far beyond the traditional function as an agent of financial intermediation. Banking not only connects funds from surplus units to deficit units but also acts as a catalyst for sustainable development by channeling financing to environmentally friendly sectors. For example, funding is channeled to renewable energy projects, green infrastructure, and other sectors that have a positive contribution to reducing carbon emissions. With a model like this, banks are able to balance the achievement of financial profit with social-environmental responsibility. In addition, sustainable banking also plays a role in encouraging financial inclusion for groups that previously

had difficulty accessing formal financing, such as MSMEs in the green sector. Through proper intermediation, banks can strengthen economic resilience, reduce dependence on polluting industries, and open new jobs in the green sectors (Aracil et al., 2021).

Indonesia itself positions itself as one of the developing countries that is serious about integrating the green finance agenda into the national banking system. The sustainable finance strategy launched by the Financial Services Authority (*Otoritas Jasa Keuangan*/OJK) has provided a clear policy and regulatory framework for national banks, such as Mandiri, BRI, and BNI, to develop innovative products in the field of green finance. For example, Bank Mandiri launched the Green Home Ownership Credit (*Kredit Pemilihan Rumah*/KPR *Hijau*) product that supports the development of environmentally conscious housing. BNI focuses on issuing green bonds and conducting climate stress tests to measure the risk of climate change on the financing portfolio. Meanwhile, BRI directs green financing to the MSME segment, which is considered the main driver of the national economy with great potential in the environmentally friendly sector (Urban & Wójcik, 2019).

However, the development of green credit in Indonesia is not without a number of challenges. According to Xu et al. (2020), common obstacles include the high cost of green project certification, limited infrastructure in green risk assessment, and minimal incentives provided by regulators. Another factor that slows down development is the low demand from business actors for green credit products. This is largely influenced by their lack of understanding of the long-term benefits of green financing. It is not uncommon for business actors to choose

"green" solutions that are cosmetic or merely a label without substantial implementation, a phenomenon known as greenwashing (Du et al., 2022).

Despite facing various obstacles, the prospects for green finance in Indonesia remain promising. The report by Wahyudin et al. (2020) confirms that the climate finance ecosystem in the Asia-Pacific region, including Indonesia, is moving towards the consolidation of increasingly innovative financing instruments. One form is blended finance, which is a combination of public and private capital to reduce the risk of green investment while expanding the scale of the project. In addition, the issuance of green sukuk and sustainable sukuk based on Islamic principles marks a diversification of financing instruments that not only expands the domestic investor base but also attracts international investors who care about sustainability (Tahiri Jouti, 2019). Thus, it can be affirmed that green finance is a relevant global trend that is increasingly rooted in Indonesia. Through the adaptive role of banking, the support of OJK regulation, and the involvement of the private sector, green finance has the potential to become an important pillar in strengthening sustainable development in the country.

2. Literature Review

2.1. Global Trends in Green Finance and Sustainable Banking

International literature shows that green finance has developed rapidly and is now viewed as a mainstream in the modern global financial system. The integration of ESG (Environmental, Social, and Governance) principles is no longer considered an additional burden that reduces competitiveness, but rather as a strategy that

provides added value, supports sustainability, and increases long-term profitability for financial institutions and the business world (Aracil et al., 2021). This trend is clearly seen in the development of various innovative financial instruments, such as green bonds, sustainability-linked loans, and blended finance, which are the main pillars in supporting the global transition to a low-carbon economy. Park and Kim (2020) emphasize that the role of central banks along with global financial institutions is very crucial, especially in facilitating cross-sector financing innovation that is able to connect public funding with private capital to enlarge the impact of sustainable development.

The global issuance of green bonds has been proven to not only provide a stable source of funding but also improve the ESG performance of companies. This also attracts the interest of institutional investors who are now increasingly focused on the sustainability agenda as part of their investment strategy. Furthermore, a meta-analysis study by Xu et al. (2020) concludes that green bonds play a dual role, namely as a green financing instrument and also as a strong signal regarding an entity's commitment to sustainability. In addition, the blended finance mechanism, including the development of Islamic blended finance through sharia instruments such as green sukuk, is increasingly considered effective in bridging the funding gap for green projects, especially in developing countries that need great support to accelerate the transition to a sustainable economy (Tahiri Jouti, 2019).

2.2. Practices and Challenges in Indonesia

In the Indonesian context, the development of sustainable finance is formally guided by the Financial Services Authority (OJK) through the Sustainable Finance Roadmap which serves as a strategic direction for the financial services sector. This document provides guidance for the banking industry to integrate green principles into policies, products, and business practices. However, Urban and Wójcik (2019) emphasizes that although the regulatory framework is relatively advanced compared to some other developing countries, implementation in the field still faces quite serious obstacles. The main challenges include the low capacity of banks to conduct green risk assessment, limited human resources who understand sustainability instruments, and minimal transparency of ESG policies that should be the standard in governance.

The real practice of a number of large banks shows that there are progressive steps that are worth noting. Bank Mandiri encourages financing in the green property sector, BRI specifically targets sustainable MSMEs, while BNI plays an important role in issuing green bonds that expand the investor base. However, data shows that the share of green credit is still very small compared to the total national banking portfolio. Cunha et al. (2021) note that the low demand from business actors is caused by the additional cost burden for project certification, limited understanding of the long-term benefits of green financing, and the high risk of renewable energy projects which are considered less attractive commercially. Furthermore, according to Du et al. (2022), digital finance has great potential to increase transparency, efficiency, and accessibility in green financing, although its application in Indonesia

is still very limited. Wahyudin et al. (2020) add that Indonesia's climate financing strategy is still more dominated by the public sector, while the contribution of the private sector still needs to be strengthened so that sustainable development targets can be achieved.

3. Methods

This study uses the library research method, namely by examining, reviewing, and interpreting various academic literature, official policy reports, and relevant international publications on the theme of green finance and sustainable banking. The choice of this method is based on the consideration that the library approach is able to provide a broader and deeper picture of theoretical and practical issues related to sustainable finance. Thus, this study does not only stop at description, but also allows for a comprehensive analysis of the development of theory, implementation in the field, as well as the challenges faced both in Indonesia and globally.

The main sources used as references come from indexed international journals, annual reports and policies from central banks, publications of multilateral institutions such as the World Bank and IMF, as well as scientific articles and policies that are considered relevant. The focus on the latest period is done with the aim that the research truly reflects the latest dynamics, given that the issue of sustainable finance is developing very quickly along with increasing global awareness of climate change and social responsibility. The articles analyzed cover various topics, ranging from the integration of ESG in the banking system, the effectiveness of instruments

such as green bonds, the innovative mechanism of blended finance, to special studies on sustainable finance strategies in Indonesia.

The analysis process is carried out systematically through several stages. First, literature identification is carried out through leading academic databases to find global trends and local implementation in Indonesia. Second, relevant articles are selected with the focus of the research, especially those that discuss the relationship between ESG principles, green financial instruments, and sustainable banking strategies. Third, a literature synthesis is carried out to find general patterns, differences in views between authors, and research gaps that are still open for further study. The results of the literature synthesis are then used to build a structured research narrative, including the identification of global trends, implementation practices in Indonesia, and an analysis of the challenges and opportunities in strengthening green banking. With this approach, this paper not only presents a summary of the existing literature but also emphasizes a broader analytical contribution to the academic discourse and policy formulation in the field of sustainable finance.

4. Results

The development of green finance and sustainable banking in the last decade marks a fundamental shift in the global financial system. This shift shows that sustainability is no longer a marginal issue, but has occupied a central position in business strategy and regulation. This new orientation was born from increasing international awareness of the increasingly real climate risk, pressure from investors

who demand social-environmental responsibility, and the urgent need for countries to adapt to the sustainable development agenda. In a global framework, the success of green finance is supported by a variety of innovative instruments, including green bonds, sustainability-linked loans, and blended finance which are designed to connect public capital with private capital. These instruments do not only function as a funding mechanism, but also as a signal that shows a company's commitment to implementing Environmental, Social, and Governance (ESG) principles in their business practices (Aracil et al., 2021).

At the international level, the green finance trend is getting stronger with the support of multilateral institutions and central banks. These institutions play an important role in integrating sustainability aspects into the monetary and fiscal policy framework. Park and Kim (2020) note that a number of central banks in various countries are starting to take into account climate risk when managing foreign exchange reserves and in formulating macroprudential policies. This step is a form of real response to the threat of climate change that can affect the stability of the global financial system. In addition, the blended finance mechanism is developing rapidly as an innovative instrument designed to attract private investment to sectors that were previously considered too risky, for example, the renewable energy and green infrastructure sectors.

By combining public and private capital support, blended finance provides a risk mitigation guarantee for investors (Jung, 2020). This way of working makes green finance not only a financial instrument but also an important catalyst in encouraging green economic growth while supporting global climate change

mitigation efforts. The principles of Environmental Preservation and Problem Reduction are in line with the concept of green economy in terms of preserving the environment during economic activities (Adamowicz, 2022). Indonesia, as one of the developing countries with very large natural resource potential, is trying to adapt to this global trend. The government through the Financial Services Authority (OJK) has launched the Sustainable Finance Roadmap, which serves as a strategic guide for national financial institutions to integrate ESG principles into their business activities.

This roadmap was prepared to ensure that the direction of Indonesia's financial policy is in line with the global sustainable development agenda. Urban and Wójcik (2019) emphasizes that although regulation in Indonesia can be said to be quite progressive compared to a number of other countries in the region, policy implementation at the operational level still faces serious obstacles. These obstacles include the limited capacity of banking to conduct green risk assessment, the lack of human resources who have special expertise in the field of sustainable finance, and the minimal transparency in the application of ESG policies by many financial institutions. This condition indicates a gap between regulation at the macro level and real practice at the micro level.

Several large banks in Indonesia have tried to take significant steps in supporting the green finance agenda. Bank Mandiri, for example, launched the Green Home Ownership Credit (KPR Hijau) product which is directed to support the development of property with environmentally friendly standards. Bank Negara Indonesia (BNI) became a pioneer in the issuance of green bonds, as well as

developing a climate stress test mechanism for its credit portfolio, so it is able to measure the risk of climate change on banking assets. Meanwhile, Bank Rakyat Indonesia (BRI) focuses more on financing the MSME sector, by introducing a green financing scheme that encourages sustainable business practices at the grassroots level (Cunha et al., 2021). This real practice shows the seriousness of national banking in adapting to global demands, although it is still limited to certain products and is not yet evenly distributed across all segments of the banking industry.

Although there have been various forms of progress, data shows that the share of green credit in the total national banking portfolio is still relatively small. This shows that green finance in Indonesia is still at an early stage of development. The main obstacles faced include the high cost of green project certification, the lack of fiscal and monetary incentives from the government, and the limited technology infrastructure needed to support comprehensive green risk analysis. Xu et al. (2020) through a meta-analysis study showed that the cost of verification and green labeling is often a significant barrier, especially for small and medium-sized businesses that have limited capital. This condition is exacerbated by the low understanding of business actors of the long-term benefits of green financing, so the demand for green credit is still relatively low. Customers are expected to use the credit they receive to develop businesses that produce environmentally friendly products. In addition, projects or companies owned by debtors are expected to provide greater benefits for the welfare of the community in the local environment. This approach not only brings financial benefits but also provides a positive impact on the environment and community welfare as a whole (Salsabila et al., 2022).

The tendency of business actors to choose green strategies that are superficial or even just cosmetic is another problem that cannot be ignored. Du et al. (2022) found that many companies prefer to run small-scale green projects or just use the green label as part of a branding strategy, compared to making serious investments in the renewable energy sector. This phenomenon is often called greenwashing, which can reduce the credibility of the green finance agenda itself. This situation indicates that a more comprehensive approach is needed from the banking side, both in the form of education and assistance, so that business actors truly understand the urgency of energy transition and the long-term benefits of green investment.

On the other hand, the prospects for the development of green financial instruments in Indonesia remain very wide open. The issuance of green sukuk and sustainable sukuk based on sharia principles shows a diversification of financing instruments that can reach a wider investor base, including investors with sharia preferences. Tahiri Jouti (2019) notes that the Islamic blended finance model has the potential to be an effective solution for funding sustainable projects while attracting investors who focus on Islamic financial principles. Given the dominance of the sharia financial sector in Indonesia, the integration of sharia-based instruments with the concept of sustainability will further enrich the green financing ecosystem in the country.

In addition, government support is a determining factor in accelerating the transformation towards a green economy. Wahyudin et al. (2020) emphasize that Indonesia's climate financing strategy is still highly dependent on the public sector. The contribution of the private sector is still limited and needs to be strengthened

through incentive policies, clearer regulation, and the formation of a conducive supporting ecosystem. The government can accelerate the transition to a green economy by providing subsidies for green projects, offering tax incentives for companies that adopt sustainable practices, and developing a framework of transparency that guarantees the credibility of green projects. Without these steps, the potential of green finance in Indonesia will not be optimal in supporting sustainable development.

Furthermore, the digitalization process of the financial sector also opens up new opportunities that are no less important. The use of digital technology can increase transparency in the financing process, reduce transaction costs, and expand public access to green financial products. Du et al. (2022) emphasize that the integration of digital finance in green banking practices is able to strengthen transparency, increase efficiency, and reduce moral hazard risks that often arise in conventional financing processes. For Indonesia, this opportunity is an important momentum to take advantage of the rapidly growing fintech ecosystem in supporting the green finance agenda. With the support of technology, green financing products can reach a wider group of people, including small business actors in areas that were previously difficult to reach by conventional banking services.

Thus, the results of this study show that green finance in Indonesia is currently at a critical transition point between great opportunities and structural obstacles. On the one hand, the potential of the green financing market is very large, financial instruments are increasingly diverse, and regulatory support continues to

grow. But on the other hand, practical implementation still faces challenges in the form of limited banking capacity, low demand from business actors, and the greenwashing phenomenon. The success of the transformation to sustainable banking thus depends heavily on the synergy between three main elements: supportive regulation, the capacity of banking institutions, and the awareness of business actors and the wider community. Without a balance of these three aspects, the implementation of green finance risks becoming just a slogan without providing a substantive impact on economic and environmental sustainability.

5. Discussion

The results of the study show that although green finance in Indonesia continues to show a growth trend from year to year, its contribution to the total national financing is still relatively limited and has not reached a significant scale. This condition indicates that there is a real gap between the regulatory policies that have been formulated by the government and financial authorities and the implementative practices that are running at the operational banking level. Obstacles that often arise, such as the high cost of green project certification, limited incentives from the fiscal and monetary side, and the low understanding of business actors about the urgency of energy transition and the long-term benefits of green financing, need to be handled more seriously through a systematic, consistent, and sustainable multi-party approach.

From a regulatory perspective, the Financial Services Authority (OJK) has indeed launched a sustainable finance roadmap that is quite progressive and

visionary. However, further steps are still needed in the form of strengthening policy instruments so that implementation truly runs effectively in the field. Fiscal incentives, for example, can be realized in the form of tax relief for environmentally friendly projects, providing interest rate subsidies for green credit, and supporting guarantee schemes for high-risk projects. This step will encourage interest not only from the banking side but also from business actors to participate more actively. On the other hand, transparency in sustainability reporting must also be strengthened through strict accountability standards so that greenwashing practices can be avoided and investor confidence is maintained.

For the banking sector, the main challenge lies in the ability to assess the risk of green projects, especially in the renewable energy and green infrastructure sectors which are still relatively new in Indonesia (Guild, 2020). The development of human resource capacity through technical training, as well as the use of digital technology, is a potential solution. The integration of big data, machine learning, and artificial intelligence in risk analysis allows banks to make more accurate and data-based financing decisions. In addition, strategic collaboration with international financial institutions can also enrich knowledge, provide access to global funding, and expand experience in managing complex ESG risks. Business actors themselves have a central role in strengthening the green finance ecosystem. The low demand for green credit is largely due to their limited understanding of the long-term benefits. Therefore, education, literacy, and business assistance programs need to be expanded massively. Through this approach, business actors will understand that

green investment is not just an additional cost, but a business strategy that can increase their competitiveness, reputation, and business sustainability.

In addition, the diversification of financial instruments is an important factor. The existence of green bonds, green sukuk, and blended finance has opened up wider financing opportunities, especially for sectors that were previously considered high-risk. However, the effectiveness of these instruments can only be realized if the verification mechanism is carried out credibly, transparently, and is strictly supervised. Without an adequate verification mechanism, the risk of a decrease in investor and public trust will be higher. Thus, this discussion confirms that the success of green finance and sustainable banking in Indonesia is highly dependent on close collaboration between regulators, banking, business actors, and the wider community. This synergy must be directed at creating an ecosystem that not only encourages financial innovation but also ensures that economic, social, and environmental sustainability runs in balance.

6. Conclusion

Green finance and sustainable banking are important pillars in supporting Indonesia's transition towards sustainable development. Globally, this trend is marked by an increase in green financial instruments such as green bonds and blended finance that have successfully attracted investors and strengthened ESG commitments. In Indonesia, the progressive steps of large banks such as Mandiri, BRI, and BNI show that the integration of sustainability into the banking system is increasingly real. However, significant challenges still hinder the growth of green

credit. Obstacles in the form of certification costs, limited incentives, and low awareness of business actors result in low demand for green products. Without stronger regulatory intervention and continuous education, green finance risks not reaching its maximum potential.

Nevertheless, the opportunity to strengthen the green financing ecosystem remains large. The diversification of instruments, including sharia-based green sukuk, and the use of digital technology can expand access and increase the credibility of the green financial system. The role of the government, regulators, banking, and business actors must synergize to build a strong foundation for sustainable finance. With a collaborative approach, Indonesia has the potential to not only become a user but also a pioneer of green financial innovation in the Asia-Pacific region. This success will make a real contribution to achieving the Sustainable Development Goals (SDGs) while strengthening national economic competitiveness in the era of global energy transition.

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