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Development of national strategy for innovative financing in Indonesia

Final report

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On behalf of:



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Implemented by



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Executive summary

This study analyses innovative financing mechanisms to support climate resilience and biodiversity in Indonesian integrated landscapes and seascapes (LaS), focusing on three selected priority regions: Central Java, Bangka Belitung Islands, and Central Sulawesi. The research method used a qualitative approach with primary data collection through Focus Group Discussions (FGDs) and in-depth interviews with stakeholders, as well as secondary data from relevant documents and reports. The study identified six innovative financing mechanisms consisting of 34 Instruments. The findings highlight the need for regulatory harmonization, stakeholder capacity building, and the development of a measurable implementation plan to maximize the effectiveness of innovative financing in achieving sustainable development goals in Indonesia.

Based on the findings, this study recommends two innovative financing mechanisms for national-level implementation: Sustainable Corporate Financing and Market-Based Financing Mechanisms. The selection of these mechanisms is supported by a strong regulatory framework, as reflected in their inclusion in the National Development Plan (RPJMN 2020–2024), which underscores the government's commitment to fostering an enabling environment for sustainable development.

The existence and successful implementation of pilot initiatives, such as Sustainable Supply Chain Financing, Payment for Ecosystem Services (PES), and REDD+, further reinforce the relevance and effectiveness of adopting Sustainable Corporate Financing and Market-Based Financing as core national strategies. Compared to other mechanisms such as Public-Private Partnerships (PPPs) and Government-Based Financing, these two approaches offer more cost-effective infrastructure development by reducing bureaucratic processes and enabling targeted investments that leverage private sector expertise. Furthermore, they provide greater flexibility than Market-Based Mechanisms by allowing for tailored solutions that address local socio-economic contexts and specific environmental challenges.

Moreover, the study also identified Private-Based Financing and Market-Based Financing as the most feasible mechanisms to be used as a pilot guideline for each of the three regions. In Central Java, Sustainable Corporate Financing can be applied to promote renewable energy projects, ecosystem restoration, and sustainable ecotourism aligned with biodiversity protection and international standards. In Bangka Belitung, Market-Based Financing can support ecological conservation. Similar to Bangka Belitung, in Central Sulawesi, Market-Based Financing can be utilized to support reforestation, land restoration, and renewable energy development, enhancing both ecological, disaster, and socio-economic resilience.

The outputs of this study include a classification of innovative financing mechanisms, a national strategy, and an implementation plan that outlines practical steps for operationalizing innovative financing mechanisms in selected priority areas.

Keywords: Innovative Financing, Climate Resilience, Biodiversity, Landscape, Seascape, Sustainability

1. Background

1.1 Overview of innovative finance in Indonesia

Innovative financing, defined as sourcing funds beyond the state budget (non-APBN), represents a transformative approach to overcoming challenges in resource mobilisation, management, and allocation¹. This approach seeks to achieve measurable social, economic, and environmental outcomes, complementing traditional financing mechanisms to address ambitious global targets such as the Sustainable Development Goals (SDGs). By expanding access to resources and introducing flexibility into financial systems, innovative financing offers a sustainable pathway to bridge funding gaps while ensuring tangible impacts. In Indonesia, innovative financing has gained momentum as part of national strategies to promote sustainable development and climate resilience. Specific policies such as OJK Regulation No. 18 of 2023 on Green Bonds and Green Sukuk and OJK Regulation No. 51 of 2017 on Sustainable Finance have provided foundational frameworks emphasising environmental, social, and governance (ESG) priorities.

In Indonesia, innovative financing has gained momentum as part of national strategies to promote sustainable development and climate resilience initiatives. Specific policies such as OJK Regulation No. 18/2023 on Green Bonds and Green Sukuk and OJK Regulation No. 51/2017 on Sustainable Finance have provided foundational frameworks emphasizing environmental, social, and governance (ESG) priorities. Complementary initiatives, including carbon taxation, carbon trading, and Payment for Environmental Services (PES), have further reinforced Indonesia's commitment to reducing greenhouse gas emissions, conserving biodiversity, and promoting resource efficiency². Recent regulations, such as the Minister of Environment and Forestry Regulation number 21 of 2022 on the Implementation of Carbon Economic Value and number 7 of 2023 on Carbon Trading Procedures in the Forestry Sector, outline procedures for carbon trading and implementing carbon economic values, marking significant progress in operationalizing low carbon initiatives. The latest trend in innovative financing, emerging in Indonesia from 2023 to 2024, reflects the efforts of the Indonesian government—particularly the Ministry of Finance and other related entities—to accelerate development using new funding mechanisms.³

These innovative financing mechanisms also align strategically with Indonesia's Long-Term National Development Plan (RPJPN) 2025–2045. They play a critical role in advancing sustainable economic practices, such as Carbon Financing, Sustainable Private Based Financing, and Circular Economy Financing, which facilitate the transition to a green and environmentally friendly economy. By supporting spatial planning based on environmental characteristics and improving coastal and marine management capacities, these mechanisms contribute to RPJPN's broader goals of environmental resilience, biodiversity protection and sustainable development.

Building on these advancements, the Sustainable Land and Seascape Initiative (SOLUSI) is an innovative program designed to address Indonesia's critical environmental and socio-economic challenges. Focusing on three priority provinces—Central Java, Central Sulawesi, and Bangka Belitung Islands—SOLUSI adopts an ecosystem-based approach to tackle issues such as mangrove degradation, deforestation, unsustainable aquaculture practices, and overexploitation of natural resources. Each region presents unique challenges, necessitating targeted interventions that enhance ecological resilience, restore biodiversity, and support sustainable livelihoods.

¹ UNDP. (2012). *Innovative Financing for Development: A New Model for Development Finance?* Discussion Paper. www.undp.org/poverty.

² Vaishali K. & Medha M. (2021). *Assessment of Mechanisms and Instruments of Climate Finance: A Global Perspective*. Chapter 15. <https://www.sciencedirect.com/science/article/abs/pii/B978012822188400004X>

³ Otoritas Jasa Keuangan. (2020). *Digital Finance Innovation Road Map and Action Plan 2020-2024*. www.ojk.go.id

The SOLUSI program integrates innovative financing mechanisms to operationalize sustainable land and seascape management strategies. Its multifaceted approach promotes eco-friendly business models, sustainable aquaculture, waste management, and ecotourism while fostering economic resilience in local communities. By emphasizing sustainability, the program aspires to achieve long-term climate adaptation and strengthen local ecosystems. Aligned with the SOLUSI program's objectives, the study aims to develop a national strategy for innovative.

Financing that is responsive to the socio-economic and environmental contexts of the target regions. This strategy provides actionable steps, resource allocations, and monitoring mechanisms to ensure accountability and effectiveness. Inclusive stakeholder engagement is central to this process, ensuring the strategy reflects the needs and expectations of all involved parties.⁴⁻⁵

Despite its potential, innovative financing faces several challenges in Indonesia. These include limited stakeholder understanding and capacity regarding financing methodologies, restricted access to capital markets for small and medium-sized enterprises (SMEs), and regulatory barriers that may hinder financial sector innovation. Addressing these obstacles requires robust partnerships, capacity-building initiatives, and regulatory adjustments to facilitate broader adoption.

By aligning innovative financing mechanisms with regional priorities, the SOLUSI program has the potential to become a national benchmark for sustainable development. Through resource mobilization and support for projects advancing Indonesia's SDGs, it underscores the country's commitment to fostering a sustainable and inclusive future.⁶

SOLUSI project

Inadequate landscape management and unsustainable land use threaten the Indonesian ecosystems. SOLUSI is a project funded by the International Climate Initiatives to mitigate the degradation of land and seascapes in Indonesia, increasing the resilience of ecosystems and thereby promoting climate-resilient livelihoods. National, sub-national, and local stakeholders improve spatial and development planning by incorporating principles of the green and blue economy. The project promotes sustainable business models, ecotourism, integrated waste management, access to sustainable finance, and supply chain partnerships. Upscaling will enhance national planning processes and promote a strong interest among farmers, including young people, women, and indigenous groups.

The project encompasses interventions at both the national and regional levels in three provinces: Central Java, Bangka-Belitung Islands, and Central Sulawesi. The three regions are Bappenas's focus areas regarding the land-to-seascape integrated approach. They are diverse in stages of conservation, restoration, socio-economic development, coastal-marine resource management, and land-use change dynamics of the diverse archipelago of Indonesia.

In all three provinces, coastal areas are under pressure from degradation through the expansion of aquaculture in mangrove ecosystems, industrial land use, and unsustainable fishing. Unsustainable mineral and sand mining. In addition to improper waste management, it constitutes a threat to land and marine ecosystems in all provinces, accounting for numerous endangered species. Biodiversity is high in all three of the provinces, with numerous endemic species.

⁴ Bappenas. (2017). *Rencana Aksi Nasional (RAN) SDGs 2017-2019*. sdgs.bappenas.go.id

⁵ Bappenas. (2017). *Rencana Aksi Nasional (RAN) SDGs 2017-2019*. sdgs.bappenas.go.id

⁶ Bappenas. (2017). *Rencana Aksi Nasional (RAN) SDGs 2017-2019*. sdgs.bappenas.go.id

1.2 Challenges and opportunities in the target regions

The project encompasses national and regional interventions across three provinces: Central Java, the Bangka Belitung Islands, and Central Sulawesi. These regions are priority areas for Bappenas in implementing the land-to-seascape integrated approach. They represent diverse stages of conservation, restoration, socio-economic development, coastal and marine resource management, and land-use change dynamics across Indonesia's vast archipelago.

In all three provinces, coastal areas face increasing degradation pressures from aquaculture expansion into mangrove ecosystems, industrial land use, and unsustainable fishing practices. Additionally, unsustainable mineral and sand mining, coupled with inadequate waste management, pose significant threats to both terrestrial and marine ecosystems—placing numerous species at risk of extinction. All three provinces boast high biodiversity, including many endemic species.

Central Java

Central Java's landscape is dominated by extensive plantation forests, which cover nearly 90% of its area. However, decades of monoculture afforestation have led to serious environmental issues, such as land degradation, reduced agricultural productivity, and biodiversity loss. Poor waste management further exacerbates hydro-meteorological risks, including water scarcity and rising sea levels, threatening both livelihoods and infrastructure. Despite these challenges, Central Java remains an economic powerhouse, with agriculture, forestry, and fishing as key sectors employing the majority of the population. In 2020, the region attracted investments totaling IDR 30,6 billion (EUR 1,8 M). This economic dynamism presents strong potential for the development of innovative financing mechanisms to support sustainable development.

One standout innovative financing initiative is the Green Sukuk ST011 by Bank Jateng, which mobilized IDR 20,025 trillion (EUR 1,16 B) in 2023. This funding, involving key stakeholders such as Bank Jateng, the Ministry of Finance, and local communities, demonstrates the potential of Islamic financial instruments in driving environmental and socio-economic improvements. Complementing this is the *Low-Carbon Organic Farming Development 2024*, funded by the SWITCH-Asia Low Carbon Rice Initiative with a budget of €2.86 million from the EU. This program promotes sustainable agriculture in Brebes, Boyolali, and Jepara, focusing on eco-friendly farming practices and reducing greenhouse gas emissions. These initiatives highlight the role of financing in enabling mangrove rehabilitation, integrated waste management systems, and the development of eco-tourism and non-timber forest products.

Bangka Belitung Islands

The Bangka Belitung Islands serve as a stark example of the environmental costs of economic growth. Although designated a UNESCO Global Geopark, the region's ecological integrity has been severely compromised by both legal and illegal mining. These activities have resulted in significant water pollution, land degradation, and biodiversity loss—undermining the islands' potential for sustainable development. With a population of 1.3 million and a land area of 1.6 million hectares, the province's economy remains heavily reliant on mining, which accounts for 56% of its income. However, this dependence is unsustainable, highlighting the urgent need for economic diversification. Potential growth sectors include geo-tourism, sustainable agriculture, and marine ecosystem restoration. The region's commodities—such as pepper, rubber, and honey—offer promising prospects, but realizing their potential requires addressing illegal mining and rehabilitating degraded landscapes. Thus, innovative financing mechanisms are crucial in this transition.

The Bangka Belitung Islands host several innovative financing initiatives that serve as valuable pilot evidence.

PT Timah Tbk's reclamation of ex-mining land and waters

In 2020, PT Timah Tbk launched a major reclamation initiative to restore ex-mining lands and waters in the Bangka Belitung Islands, with a total investment of IDR 29.05 billion (EUR 119 K). Key stakeholders involved include PT Timah Tbk, local governments, the Ministry of Energy and Mineral Resources, the Ministry of Environment and Forestry (KLHK), and several NGOs. The project aims to mitigate the environmental impacts of mining activities and promote sustainable land use in the region.

Rehabilitation of abandoned tin mining sites in Juru Seberang Village

The rehabilitation of abandoned tin mining sites in Juru Seberang Village received IDR 2 billion (EUR 116 K) in funding from the Indonesia Climate Change Trust Fund (ICCTF) for the development of the Belitung Mangrove Park. The project is supported by the local community group Seberang Bersatu, the ICCTF, local government authorities, and various NGOs. It aims to transform degraded mining areas into ecotourism destinations, promoting both environmental restorations, biodiversity protection and community-based economic development.

Tax incentives for eco-friendly investments and the issuance of green bonds tied to sustainable mining practices could attract additional funding, fostering economic resilience while protecting the environment.

Central Sulawesi

Central Sulawesi is distinguished by its rich biodiversity, including forests, coral reefs, and marine ecosystems. Yet, this natural wealth is increasingly threatened by illegal logging, coral reef degradation, and excessive pesticide use. Moreover, the province is highly vulnerable to natural disasters—including earthquakes and floods—due to its location at the convergence of multiple tectonic plates and its complex topography. Economically, Central Sulawesi depends on agriculture and fisheries, with major commodities including cocoa, coffee, and seafood. With a population of 2.8 million and approximately 4.0 million hectares of forested land, the region holds strong potential for sustainable economic development. Investment inflows have grown substantially, from IDR 3.012 billion (EUR 175 K) in 2021 to IDR 4.772 billion (EUR 277 K) in 2023, reflecting increasing investor confidence in the region's future.

Several large-scale initiatives underscore the importance of innovative financing in Central Sulawesi.

Central Sulawesi Rehabilitation and Reconstruction Project (CSRRP)

The Central Sulawesi Rehabilitation and Reconstruction Project (CSRRP) is a large-scale initiative with total funding of USD 150 million, running from 2019 to 2024. Supported by the World Bank, local governments, and NGOs, the project aims to rebuild and rehabilitate infrastructure and communities affected by natural disasters. It focuses on ensuring a resilient and sustainable recovery across the region.

REDD+ Scheme in Central Sulawesi

The REDD+ scheme in Central Sulawesi aims to reduce emissions from deforestation and forest degradation. Funded by both local and international sources, the initiative involves key stakeholders such as the Central Sulawesi Regional Development Planning Agency (BAPPEDA), local governments, and NGOs. The program promotes sustainable forest management, biodiversity conservation, and supports global climate change mitigation efforts.

1.3 Objectives

The project aims to conduct analytical studies on innovative financing mechanisms to support climate resilience and biodiversity conservation in Indonesia's Landscape and Seascape (LaS) areas, focusing on three priority regions, as mentioned before. The objectives include:

1. **Assess and review innovative financing mechanisms**

This involves evaluating existing mechanisms and their relevance to addressing climate resilience and biodiversity issues in LaS areas.

2. **Develop and maintain communication with stakeholders**

Establishing and fostering collaboration with key stakeholders, including government entities, financial institutions, NGOs, and private sector actors, to ensure inclusive and effective engagement.

3. **Draft a national strategy for innovative financing**

Formulating strategic frameworks that align with national priorities and promote sustainable development.

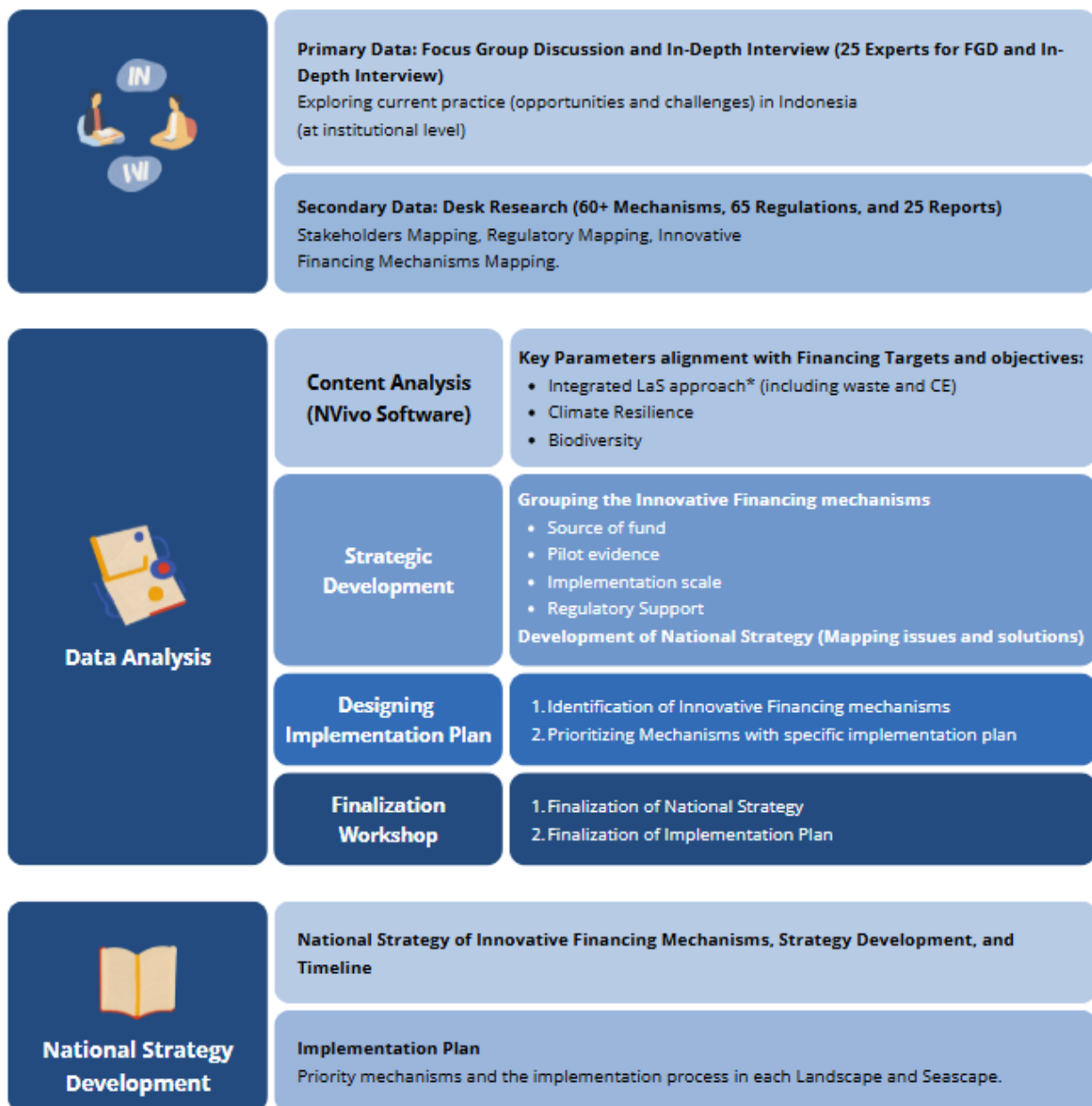
4. **Formalize a national implementation plan**

Developing actionable implementation plans that focus on three priority regions, ensuring scalability and long-term sustainability of the innovative financing mechanisms.

2. Conceptual framework and methodology

2.1 Conceptual framework

In developing a national strategy for innovative financing in Indonesia and ensuring its suitability and possibility for further implementation and development, the research consists of three main steps, namely Data Collection, Data Analysis, and Output. Each step is designed to ensure the final result is a financing mechanism that is relevant, applicable, and supports priority areas development.



* Does not change the Physical, Biodiversity, Chemistry, and Social Economy conditions of LaS

Figure 2.1 Conceptual framework

Step one: data collection

The initial step focuses on extensive desk research encompassing over 60 financing mechanisms, 65 regulatory frameworks, and 25 relevant reports. The research methodology involves stakeholder mapping, regulatory mapping, and the identification of innovative financing mechanisms. This step serves as the foundational process for understanding the diverse financial instruments and regulatory landscapes that influence the implementation of sustainable financing initiatives. The output of this stage is a structured dataset that categorizes existing mechanisms, regulatory challenges, and best practices.

Step two: data analysis

The second step employs qualitative content analysis using NVivo software to extract key insights from the collected data. The analytical process is structured into four main dimensions:

- a. Key parameter analysis: This involves assessing the alignment of financing mechanisms with sustainability targets, particularly within the integrated Landscape, Seascape (LaS) approach, climate resilience, and biodiversity conservation.
- b. Strategic development: Mechanisms are grouped based on their implementation feasibility, pilot evidence, scalability, sources of funding, and regulatory support. This process enables the identification of financing models that demonstrate high adaptability to sustainable development goals.
- c. Implementation plan design: The strategic financing mechanisms identified in the previous step are categorized based on their applicability to specific landscapes and seascapes. Priority is given to mechanisms that align with national and regional policy frameworks.
- d. Finalization and stakeholder engagement: A finalization workshop is conducted to validate findings, ensure alignment with national priorities, and refine the proposed implementation plan.

Step three: output

The final step translates analytical findings into a structured National Strategy for Innovative Financing Mechanisms, encompassing a detailed strategy development framework and implementation timeline. The implementation plan prioritizes mechanisms based on their effectiveness in specific landscapes and seascapes, ensuring a contextualized approach to financial sustainability. The proposed framework adheres to the principle of non-disruption, ensuring that financial mechanisms do not adversely affect the physical, biodiversity, chemical, or socioeconomic conditions in targeted regions.

Limitations:

This study was conducted over the period from May 2024 to March 2025; therefore, all findings and analyses reflect the conditions within that timeframe. The exchange rates used in this study are based on the rates as of April 29, 2025, with 1 Euro equivalent to IDR 19,080.30 and 1 Euro equivalent to USD 1,140.45.

From the framework, it is found that this research process does not only focus on theoretical aspects but also on the feasibility of implementation in the field. The result in the form of recommendations for innovative financing mechanisms is expected to be able to answer the challenges of managing Landscape, Seascape, Climate Resilience, and Biodiversity, comprehensively while encouraging the achievement of Sustainable Development Goals (SDGs) in Indonesia.

2.2 Methodology

This study aims to develop a National Strategy and Implementation Plan for innovative financing mechanisms to address climate resilience and biodiversity conservation in the Indonesian Landscapes and Seascapes (LaS) region, especially in three priority areas. To achieve this, the study employs a qualitative method with a structured methodological framework consisting of four main stages: Data Collection, Data Analysis, Finalization Workshop, and Final Report Preparation. A critical component of the study is the structured categorization of financing mechanisms **based on Source of Funding**. This ensures a systematic and targeted approach in assessing the applicability of different financial instruments.

SOLUSI provides a structured approach to classify development of Innovative Financing Mechanisms. The process begins with the classification of problems into four main clusters: Landscape (Ls), Seascape (Ss), Biodiversity (Bd), and Climate Resilience (Cr). The Landscape cluster focuses on the rehabilitation of critical land, clean water management, and waste management practices. In contrast, the Seascape cluster addresses coral reef restoration and marine ecosystem management. Additionally, the Biodiversity cluster emphasizes conserving biodiversity within forests, mangroves, and coastal ecosystems. Climate resilience is also highlighted as a significant concern aimed at enhancing resilience against hydrometeorological disasters such as floods and droughts.

Following the classification phase, the subsequent step involves the identification of mechanisms, which comprise several critical components essential for effective implementation. The initial component pertains to the examination of existing pilot evidence, entailing a comprehensive analysis of all currently available instruments and mechanisms that can be employed to address related or analogous issues effectively. This scrutiny allows for an assessment of their efficacy and adaptability in various contexts. Next, identifying sources of funding necessitates a thorough investigation into the composition of funds required for financing these instruments' implementation, highlighting potential financial resources and aiding in understanding optimal allocation strategies. Furthermore, significant emphasis is placed on engaging key stakeholders throughout this process; analyzing stakeholder involvement includes assessing which parties are actively engaged in executing these mechanisms at macro (national), meso (regional), and micro (local) levels. Understanding these dynamics is vital for ensuring that all relevant voices are considered, and collaborative efforts are fostered. Lastly, conducting an analysis of regulatory support is imperative to determine whether existing regulations facilitate or impede the implementation of related mechanisms and instruments. This evaluation provides insights into legal barriers while identifying opportunities for regulatory enhancements that could promote more effective execution. Ultimately, through meticulous attention to the steps, this comprehensive approach culminates in identifying six mechanisms alongside twenty-eight innovative financing instruments specifically tailored to meet Indonesia's financing needs effectively.

2.3 Data collection

The data collection phase integrated primary and secondary data sources:

- a) **Primary data:** Conducted Focus Group Discussions (FGDs) and in-depth interviews with representing key stakeholders, including government agencies, private sector actors, and non-governmental organizations actively engaged in innovative financing initiatives. These methods provided qualitative insights into the challenges, opportunities, and operational mechanisms of innovative financing in the LaS context.
- b) **Secondary data:** Gathered related data source from regulatory documents and reports/publications. These sources included existing policy frameworks, case studies, and technical reports related to innovative financing mechanisms globally and locally.

Table 2.1 Detailed of data collection

Primary data	Secondary data	
25 Total Expert Informants from FGD & In-depth Interview	65 Regulations	25 Reports

2.4 Data analysis

The collected data underwent a rigorous analysis process, encompassing the following steps:

1. **Transcription and coding:** Interview data were transcribed verbatim and processed using NVivo software. This enabled systematic content analysis and identification of recurring themes and patterns.
2. **Content analysis:** A thematic approach was applied to extract key findings from both primary and secondary data. The analysis provided insights into the roles of stakeholders, regulatory gaps, and scalability of innovative financing mechanisms.
3. **Synthesis of findings**

The results from primary and secondary data were synthesized to develop preliminary recommendations for the strategy and implementation plan.

2.5 Finalization workshop

The finalization workshop served as a critical stage in refining the findings and recommendations derived from the data collection and analysis phases. This workshop was designed to validate key insights, gather feedback from stakeholders, and ensure alignment with regional and national priorities in innovative financing for climate resilience and biodiversity conservation.

2.6 Final report preparation

The final report encapsulates the entire study process, presenting a comprehensive strategy and implementation framework for innovative financing in the Indonesian Landscapes and Seascapes (LaS) region.

3. Regulatory and stakeholder analysis

3.1 Regulatory mapping and analysis: clustering Indonesia's regulatory frameworks for innovative financing

The regulatory framework plays a critical role in enabling or impeding the implementation of developing innovative financing mechanisms. This section delves into the regulatory analysis conducted as part of the national strategy development, highlighting key issues related to the overlap, suitability, completeness, and harmonization. These key issues are essential because these factors directly influence the feasibility, scalability, and attractiveness of innovative financing schemes.

Without a coherent and supportive regulatory environment, innovative financing initiatives may face legal uncertainty, operational inefficiencies, and limited stakeholder participation. This section draws from the regulatory analysis conducted during the development of the national strategy, aiming to identify and address these challenges to create a more enabling ecosystem for innovative financing in Indonesia.

The regulatory framework plays a critical role in either enabling or hindering the development and implementation of innovative financing mechanisms. This section presents the results of a regulatory analysis conducted as part of the national strategy development, highlighting key issues related to:

- A. Suitability (overlapping and conflicting regulations);
- B. Implementation (status of regulation);
- C. Completeness (lack of specific legal frameworks);
- D. Collaboration and harmonization (coordination among stakeholders).

Addressing these issues is essential, as they directly impact the feasibility, scalability, and attractiveness of innovative financing schemes. Without a coherent and supportive regulatory environment, such initiatives may encounter legal uncertainties, operational inefficiencies, and limited stakeholder engagement. This analysis aims to identify and mitigate these regulatory challenges, thereby fostering a more conducive ecosystem for innovative financing in Indonesia.

1. Suitability: overlapping and conflicting regulations

Several regulations in Indonesia exhibit overlaps and inconsistencies, particularly in their objectives, implementation focus, and technical mechanisms. These misalignments not only lead to conflicting policy directions but also contribute to legal uncertainty, weaken inter-agency coordination, and slow the adoption of new policies and innovations. As a result, they pose significant barriers to the development of innovative financing initiatives. Key findings from the analysis include:

- Carbon economic value

Presidential Regulation (Perpres) No. 98 of 2021 on the Implementation of Carbon Economic Value adopts a market-based approach through mechanisms such as carbon trading and carbon taxation (Article 12, paragraph 1). However, this approach may conflict with Law No. 32 of 2009 on Environmental Protection and Management, which prioritizes the precautionary principle and pollution prevention through administrative means. While the law does acknowledge economic instruments (Articles 42–43), differences in policy orientation result in disharmony. In practice, this has led to delays and uncertainty for private sector actors wishing to participate in carbon trading schemes, as procedures and official recognition are often unclear.

- Disaster fund management

Presidential Regulation No. 75 of 2021 introduces a centralized pooling fund mechanism for disaster response financing. This approach, however, contradicts the decentralization principle emphasized in Law No. 24 of 2007 (Article 8(d)), which grants autonomy to local governments in disaster management. The conflict can result in inefficiencies, such as delayed disbursement of emergency funds to local authorities. For instance, during the 2021 flood in South Kalimantan, the local government experienced difficulties accessing emergency resources due to procedural bottlenecks at the national level.

- Measurement, reporting, and verification (MRV)

Perpres No. 98 of 2021 mandates the use of independent verification entities (Article 15, paragraph 3), while Law No. 32 of 2009 (Article 63, paragraph 1) states that verification should be conducted by the government. This regulatory inconsistency creates uncertainty in national carbon reporting systems. In practice, some REDD+ and forest-sector carbon offset projects have faced delays in validation due to unclear authority on who can legally conduct verification—impacting the credibility and economic value of carbon mitigation outcomes.

Such conflicts highlight the need for regulatory alignment to streamline implementation and improve coherence.

2. Implementation: status of regulation

Most regulations supporting innovative financing in Indonesia remain in the early stages of implementation. The lack of technical instruments, operational guidelines, and effective oversight mechanisms significantly limits the practical effectiveness of these regulations. This gap between national policy frameworks and on-the-ground execution has serious implications—delaying the development of IF schemes, discouraging market participation, and weakening long-term investor confidence. Key implementation challenges include:

- Disaster financing (Presidential Regulation No. 75 of 2021)

While this regulation introduced a national disaster *pooling fund* mechanism, it lacks clear technical procedures for fund disbursement, application workflows, and post-disaster fund accountability. As a result, local governments face uncertainty during emergency response, limiting the integration of IF into disaster risk management. For example, there is currently no national digital platform available for transparent monitoring and reporting of pooling fund usage.

- Payment for environmental services (PES)

PES programs have been piloted in several regions such as Sumatra and Kalimantan, but no standardized technical guidelines exist for ecosystem service valuation, contractual processes, or payment mechanisms. Consequently, PES implementation remains fragmented and has not attracted significant private sector investment. This limits PES's potential as a sustainable IF mechanism for ecosystem conservation.

- Sustainable financing (POJK No. 51/POJK.03/2017)

This regulation mandates financial institutions to adopt Environmental, Social, and Governance (ESG) principles. However, in the absence of strong legal enforcement or penalties, implementation remains voluntary and inconsistent across institutions. The lack of a standardized national ESG rating system also creates challenges for investors in distinguishing genuinely sustainable institutions from those engaging in greenwashing practices.

These issues reflect the regulatory gap between policy design and practical applicability, hampering progress toward achieving national and global sustainability goals.

3. Completeness: lack of specific legal frameworks

Despite the issuance of several regulations supporting innovative financing, Indonesia still faces significant gaps in its legal framework that hinder sector-specific implementation and scalability. The lack of comprehensive and detailed policies creates uncertainty for investors, financial institutions, and beneficiary communities. Strengthening the regulatory foundation is critical to ensure that IF instruments are not only legitimate but also operationally viable. Key areas requiring regulatory improvement include:

- **Market based financing**
Existing regulations lack detailed provisions on reporting, monitoring, and verification (MRV) mechanisms—especially for small and medium enterprises (SMEs). There is also no clear framework for cross-border trading such as carbon, which limits Indonesia’s ability to participate in international carbon markets. These legal gaps reduce investor confidence and limit the growth potential of Indonesia’s carbon market.
- **Blended financing**
Blended financing in Indonesia still faces challenges in engaging the informal sector due to the lack of clear technical guidelines and adequate incentives. Actors such as MSMEs, local communities, and micro-enterprises in environmental sectors often lack the legal and administrative capacity to access funding. Without inclusive regulations, blended finance risks favoring large, formal entities—limiting its potential for broad-based impact and long-term sustainability.
- **Donor and philanthropic financing**
The Donor and Philanthropic sector hold significant untapped potential to contribute to long-term development and sustainability goals. However, in the absence of tax incentives, accountability mechanisms, or participation guidelines, Donor and Philanthropic funding remains fragmented and largely focused on short-term initiatives. Clear regulations could help channel Donor and Philanthropic capital toward climate action, green innovation, and inclusive social programs.
- **Public-private partnerships (PPP)**
Current PPP policies are primarily geared toward large-scale infrastructure projects—such as highways, ports, and energy facilities. However, sustainable and micro-scale PPPs have yet to be meaningfully developed. These include partnerships in community-based renewable energy, local sanitation systems, and waste management services. The absence of enabling regulations for small, sustainability-oriented PPPs limits participation from social enterprises and cooperatives in the IF ecosystem.

Filling these gaps is essential to broaden the reach of innovative financing mechanisms across sectors and scales.

4. Collaboration and harmonization: coordination among stakeholders

The success of innovative financing depends not only on supportive regulations but also on strong collaboration among key stakeholders—including central and local governments, the private sector, and civil society. In Indonesia, coordination across these actors remains challenged by structural and institutional barriers. The lack of harmonization slows policy execution, creates program overlaps, and reduces the overall effectiveness of IF initiatives. Key coordination issues include:

- **Government-private sector collaboration**
In the case of disaster financing (Presidential Regulation No. 75/2021), private sector involvement is still minimal due to the absence of clear incentives or defined roles in managing the disaster pooling

fund. As a result, the private sector's potential contributions to disaster risk financing remain largely untapped. In contrast, sustainable finance regulations (POJK No. 51/2017 and POJK.03/2017) have started to engage banks and capital markets, yet their activities are poorly coordinated with local governments. This misalignment leads to a disconnect between local development priorities and sustainable investment portfolios.

- Inter-ministerial coordination

The carbon economic value regulation (Presidential Regulation No. 98/2021) requires strong synergy between the Ministry of Environment and Forestry (technical regulator) and the Ministry of Finance (fiscal authority). In the absence of proper coordination, policy conflicts may emerge—such as misalignment between carbon trading mechanisms and fiscal incentives. Similarly, the circular economy agenda requires policy integration among the Ministry of Industry, Ministry of Energy and Mineral Resources, and Ministry of Environment, yet these efforts often remain siloed, resulting in inefficiency and fragmented programs.

- Public participation

Current PES schemes do not fully integrate local communities as primary actors in environmental protection, despite their direct role on the ground. The lack of participatory approaches threatens the long-term sustainability of these programs. Furthermore, Donor and Philanthropic actors and civil society organizations lack a formal policy framework to facilitate their contributions to sustainable finance, leading to unstructured and underutilized engagement.

By addressing these gaps and challenges, Indonesia can create a supportive regulatory environment that facilitates the growth and adoption of innovative financing mechanisms, driving progress toward its sustainability goals.

3.2 Stakeholder mapping and analysis

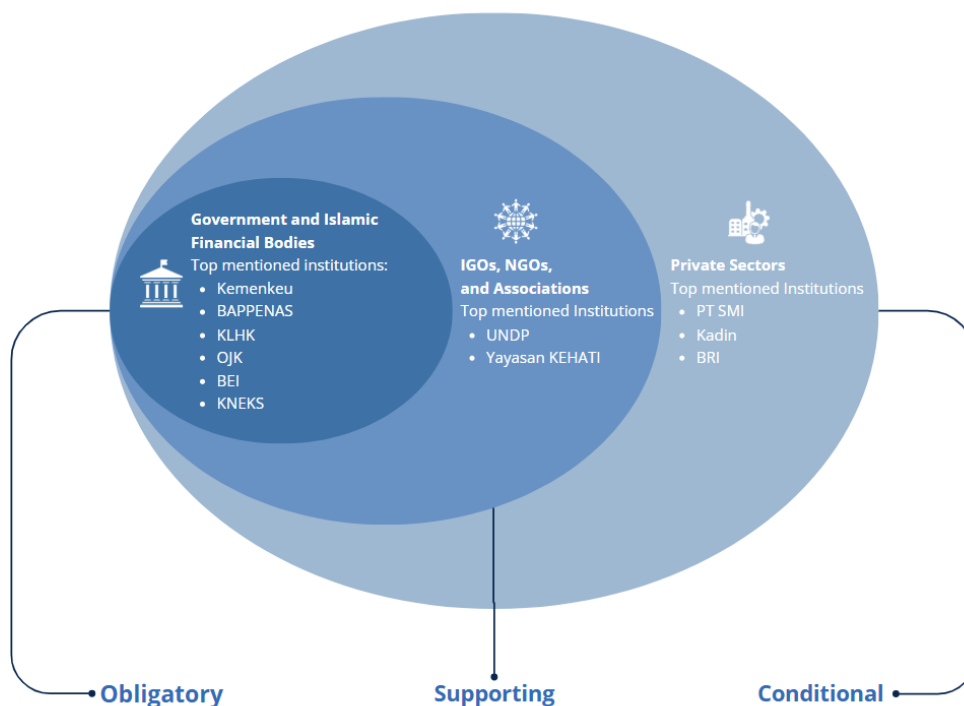


Figure 3.1 The onion diagram of stakeholder analysis

The onion diagram in this stakeholder analysis, see figure 4.1, serves as a visual tool for mapping and categorizing stakeholders according to their level of involvement and influence in innovative financing mechanisms. It aids in understanding the distribution of responsibility and influence among various institutions within Indonesia's financing landscape. This diagram is informed by data derived from NVivo analysis and in-depth interviews, ensuring it accurately reflects real engagement patterns among key stakeholders. The diagram illustrates the interactions among different groups based on their influence and frequency of mention regarding innovative financing mechanisms. Stakeholders are categorized into three layers: Obligatory, Supporting, and Conditional. Below is a detailed explanation of each layer:

1. Obligatory stakeholders

Obligatory stakeholders are the most frequently mentioned and influential actors in the implementation, roles, and responsibilities related to innovative financing mechanisms in Indonesia. The mapping of obligatory stakeholders highlights Government and Islamic Financial Bodies. This group is crucial due to their significant involvement across various financing mechanisms. Government institutions such as KEMENKEU (Ministry of Finance), BAPPENAS (Ministry of National Development Planning), KLHK (Ministry of Environment and Forestry), OJK (Financial Services Authority), and BEI (Indonesian Stock Exchange) are the most frequently mentioned. Additionally, KNEKS (National Committee for Islamic Finance) is the top mentioned among Islamic financial bodies.

2. Supporting stakeholders

Supporting stakeholders plays important roles but is not as central as the obligatory stakeholders. The supporting stakeholders include IGOs (International Organizations), NGOs (Non-Governmental Organizations), and Associations. Notable institutions include UNDP and KEHATI (Indonesian Biodiversity Foundation), which highlight their engagement in environmental and disaster-related projects.

3. Conditional stakeholders

Conditional stakeholders have more limited involvement, typically depending on the specific financing mechanism. The conditional stakeholders identified are from the Private Sector. Top mentioned institutions include PT SMI (Sarana Multi Infrastruktur), KADIN (Indonesian Chamber of Commerce and Industry), and State-Owned Financial Intermediaries such as BRI (Bank Rakyat Indonesia).

3.3 Existing classification of innovative financing mechanisms

Innovative financing mechanisms are a cornerstone for advancing sustainability goals in an increasingly resource-constrained world. A wide range of institutions—including government agencies, international organizations, and non-governmental entities—have played key roles in shaping and evolving these mechanisms. This report critically examines their approaches to identify existing gaps and highlight opportunities for Indonesia to enhance its strategies. The goal is to build upon the foundational work of these institutions while identifying areas where Indonesia can further innovate to address its unique socio-economic and environmental challenges.

Classification of innovative financing mechanisms by the Indonesian government

The Indonesian government has undertaken significant measures to advance innovative financing through a combination of regulatory frameworks and targeted programs. These efforts align with national priorities and aim to create a robust ecosystem for sustainable development.

1. RPJPN Based on Law No. 53 of 2024: The Long-Term National Development Plan (RPJPN) provides a foundation for financing mechanisms that include impact investments, blended financing, carbon trading, and syariah-based financial instruments. This framework underscores Indonesia's commitment to leveraging innovative tools for achieving its development objectives. However, challenges remain in integrating these mechanisms into local and regional contexts effectively.
2. Articles 5 and 6 of Perpres No. 6/2024 (BAPPENAS): These articles introduce a structured approach to financial instruments, categorizing them into impact grants, impact loans, thematic bonds, market mechanisms, and results-based financing. By emphasizing government-regulated outcomes, this policy seeks to ensure accountability and measurable impacts. Nonetheless, operational bottlenecks, such as limited technical capacity and resource allocation, pose hurdles to achieving optimal outcomes.
3. POJK 14/2023 (OJK): The Financial Services Authority (OJK) has formalized Indonesia's carbon trading mechanism, delineating roles for participants, trade instruments, transaction processes, and oversight systems. This regulation marks a pivotal step towards a structured carbon market. Despite this, ensuring market liquidity and equitable participation among stakeholders remains a critical issue.

3.4 Classification of innovative financing mechanisms by international agencies

International organizations play a pivotal role in introducing innovative financing mechanisms tailored to global sustainability challenges. Their initiatives offer valuable insights and complementary resources for Indonesia's efforts.

1. **BIOFIN by UNDP:** The Biodiversity Finance Initiative (BIOFIN) emphasizes biodiversity-focused financing through debt/equity instruments, market-based solutions, and grants. While these approaches hold promise, the scale of financial resources mobilized under BIOFIN remains limited in addressing Indonesia's vast biodiversity challenges.
2. **Global Environment Facility (GEF)** The GEF employs Blended Financing, grants, and concessional loans to support green energy and other sustainability projects. While the GEF provides critical funding, there is a need for stronger alignment between GEF initiatives and Indonesia's local priorities to maximize impact.
3. **International Finance Corporation (IFC)** By focusing on private-sector engagement through green and climate bonds, the IFC promotes scalable solutions for sustainability. However, the reliance on private sector willingness to adopt these mechanisms often limits broader adoption, especially in emerging markets like Indonesia.
4. **Climate Policy Initiative (CPI)** The CPI's categorization of mechanisms by performance-based and Blended Financing approaches highlights the importance of tailored financial solutions. However, ensuring effective implementation in diverse regulatory environments remains a persistent challenge.
5. **Green Climate Fund (GCF)** Employing grants, concessional loans, and guarantees, the GCF provides essential resources for climate resilience initiatives. Nevertheless, navigating GCF's complex application processes and stringent requirements has often impeded timely access to funding.
6. **Global Innovation Lab for Climate Finance** This initiative emphasizes risk mitigation and Blended Financing, introducing innovative models such as insurance-linked bonds. While these instruments present exciting opportunities, their technical complexity and high initial costs may limit their applicability in Indonesia.
7. **World Resources Institute (WRI)** WRI's focus on results-based and Blended Financing for climate initiatives underscores the importance of outcome-driven investments. However, integrating WRI's methodologies within Indonesia's institutional frameworks requires significant adaptation and capacity building.
8. **Asian Development Bank (ADB)** The ADB supports innovative instruments such as green bonds, blue bonds, and blended financing for sustainable projects. While these mechanisms contribute to Indonesia's financing ecosystem, aligning ADB's priorities with Indonesia's unique socio-economic and environmental contexts is essential for sustained success.

4. Innovative financing in Indonesia

4.1 Existing innovative financing

This study classifies six categories of innovative financing mechanisms aimed at supporting climate resilience and biodiversity in Indonesia's landscapes and seascapes (LaS), comprising a total of 34 financing instruments. Table 4.1 outlines each category, including their scope, limitations, and relevance to LaS, climate resilience, and biodiversity. The classification is based on four key dimensions: source of funding, pilot evidence, implementation scale, and regulatory support, providing a contextual and practical framework for understanding the applicability of each financing mechanism.

Table 4.1 Finding's on innovative financing classification and its scope

No	Mechanism	Definition	Instrument
1	Market Based Financing	Refers to financing mechanisms that leverage various levels of market-based instruments to allocate resources toward sustainable initiatives efficiently. These mechanisms involve negotiation processes—whether within capital markets or outside them—between providers and beneficiaries of environmental services.	(1-A) Carbon Credit (1-B) Carbon Exchange (1-C) Carbon Offset* (1-D) Payment for Environmental Services (PES) (1-E) REDD+ (1-F) Sustainable and Responsible Investment (SRI) (1-G) ESG Funds
2	Sustainable Government Financing	Government-led initiatives that mobilize funds for sustainable projects (Non APBN Financing)	(2-A) Green Bonds/Sukuk* (2-B) Blue Bonds/Sukuk* (2-C) Coral Bonds
3	Sustainable Corporate Financing	Corporate commercial funding that adopts investment strategies incorporating environmental, social, and governance (ESG) factors into decision-making processes.	(3-A) Blue Loans/Investment (3-B) Green Loans/Investment (3-C) Water Credit (3-D) Climate Fund (3-E) Impact Investment (3-F) Sustainable Supply Chain Finance (3-G) Corporate Green Bond / Sukuk (3-H) Corporate Blue Bond/ Sukuk
4	Public Private Partnership (PPP)	A collaborative arrangement between the government and the private sector designed to deliver public services or	(4-A) Build Operate Transfer/BOT (4-B) Build Own Operate Transfer / BOOT

No	Mechanism	Definition	Instrument
		infrastructure projects by leveraging the strengths and resources of both parties.	(4-C) Build Own Operate (4-D) Concession
5	Blended Financing	A financing approach that integrates government, public funds, private investments, Donor and Philanthropic contributions, and obligatory financing mechanisms to create a more attractive risk-return profile, encouraging greater private sector involvement in development and sustainable projects.	(5-A) Green Cash Waqf Linked Sukuk (CWLS) (5-B) Sukuk Linked Waqf (5-C) Grant Loan Financing
6	Donor and Philanthropic Financing	A financial mechanism focused on promoting environmental, social and economic development by leveraging Donor and Philanthropic principles and values.	(6-A) Environmental Grants (6-B) Environmental Social Funds (6-C) Conservation Endowment (6-D) Sustainable Biodiversity through Islamic Social Funding (6-E) Corporate Social Responsibility (6-F) Climate Change Trust Fund (CCTF) (6-G) Result Based Grant (6-H) Pooling Fund for Disaster (6-I) Debt Swap for Nature

Note: *Note: *Sukuk is the Islamic equivalent of conventional bonds

4.2 Six innovative financing mechanisms

The six mechanisms offered by SOLUSI are categorized based on the source of funds, pilot evidence, implementation scale, and regulatory support, with 34 identified instruments that demonstrate significant potential for further development. This approach focuses on key areas such as natural landscapes, seascapes, biodiversity, and climate resilience, allowing stakeholders to allocate resources more effectively where they are most needed. By strategically aligning efforts, the approach enhances the financial impact of initiatives and supports the border goal of achieving sustainable development across ecosystems. This sub-chapter will discuss six innovative financing mechanisms, providing their implementation details, examples of pilot evidence, and an analysis of their application in Indonesia.

4.2.1 Market based financing

Market-based approaches leverage market processes to allocate resources effectively for sustainable initiatives by providing economic incentives for enterprises and governmental entities (Baumber & Metternicht, 2022). These mechanisms operate on the premise that economic value can be assigned to environmental goods and services, such as emission reductions, ecosystem preservation, and resource efficiency. In this system, organizations that generate positive environmental impacts are rewarded financially, while those that cause negative externalities are required to pay fees for the damage they create. As a result, the market mechanism helps balance economic incentives with environmental goals (Valerie et al., 2013).

Market-based finance relies on the interaction between supply and demand to set prices for environmental services or emission allowances. Regulations play a crucial role in shaping the market environment, encouraging enterprises to participate either voluntarily or through mandates. The resulting market can take various forms, such as direct trading among commercial entities, a government-regulated auction system, or a specialized exchange that allows for transparent and standardized transactions. This approach promotes flexibility in achieving environmental objectives without heavily relying on subsidies or government budgets. It also incentivizes the private sector to invest in eco-friendly technologies and sustainable business practices, fostering a synergy between economic and environmental interests. Table 4.2 provides a detailed breakdown of the instruments in Market-Based Financing that have implementation in Indonesia.

Table 4.2 Instruments of the market-based financing

Code	Instrument name	Description	Supporting regulation	Object focus	Scope
1-A	Carbon Credit	An instrument representing the ownership of one ton of carbon dioxide, typically in the form of certificates or technical approvals.	● Permen LHK No. 21 of 2022 ● Perpres No. 98 of 2021 ● Permen ESDM No. 16 of 2022	CR	Macro
1-B	Carbon Exchange	A market-based mechanism designed to reduce greenhouse gas emissions by facilitating the trading and reporting of Carbon Units.	● POJK No. 14 of 2023 ● Permen LHK No. 7 of 2023	CR	Macro
1-C	Carbon Offset	Financial instruments that enable companies and individuals to compensate for their carbon emissions by purchasing carbon credits from projects that reduce or eliminate emissions.	● Permen LHK No. 20 of 2022 ● POJK No. 15 of 2023	CR	Macro
1-D	Payment for Environmental Services (PES)	PES is a market-based system that rewards landowners and resource providers for delivering ecosystem services. As a form of result-based payment, it incentivizes the conservation and sustainable use of natural resources to promote environmental sustainability.	● UU No. 32 of 2009 ● Permen LHK No. 83/2016	Ls, Cr	Meso

		For example, it links upstream and downstream stakeholders, particularly in water distribution.			
1-E	REDD+ (Reducing Emissions from Deforestation and Forest Degradation)	REDD+ is a global initiative that provides financial incentives to developing countries for reducing emissions from deforestation and forest degradation. It supports forest conservation, sustainable management, carbon stock enhancement, and biodiversity protection through a result-based payment system.	● Permen LHK No. 70 of 2017 ● Permen LHK No. 71 of 2017	Ls, Cr	Meso
1-F	Sustainable and Responsible Investment (SRI)	SRI is an investment approach that integrates environmental, social, and governance (ESG) factors into decision-making to achieve sustainable, ethical, and financially competitive outcomes. It aims to align investments with long-term societal and environmental well-being, encouraging responsible business practices while generating positive returns.	● POJK No. 51 of 2017 ● POJK No. 18 of 2023 ● POJK No. 60 of 2017	Ls, Bd	Meso and Micro
1-G	ESG Funds	Instrument that incorporates sustainability criteria, particularly the application of ESG into the investment strategy of private companies aiming to attract investors focused on ethical and sustainable development.	● Perpres No. 18 of 2020 ● RPJMN for 2020-2024 ● Pepres No. 111 of 2022 ● Law Number 32 of 2009 ● Law Number 40 of 2007 ● Government Regulation No. 47 of 2012	Ls, Ss, Bd, CR	Meso and Micro

Implementing market-based mechanisms is increasingly crucial for accelerating the transition to a low-carbon economy, particularly by facilitating initiatives that reduce greenhouse gas emissions. Key mechanisms such as PES and REDD+ are essential for providing important production resources while simultaneously maintaining and protecting the environment and biodiversity. Result-based mechanisms like Payment for Environmental Services (PES) and REDD+ reward those who protect ecosystems and reduce emissions, promoting sustainable land and forest management. SRI and ESG funds further support climate action by encouraging private sector investment in environmentally and socially responsible practices, aligning financial goals with sustainable development. Together, these mechanisms serve as crucial tools to bolster climate action, stimulate innovation in clean technologies, and mitigate the effects of climate change, aligning with global efforts to meet the objectives of the Paris Agreement. By incorporating clear pricing mechanisms, market-based processes not only improve efficiency and industrial competitiveness in emissions reduction but also create new investment opportunities in renewable energy and resource efficiency. This strategy connects sustainability with economic incentives, advancing climate change mitigation while fostering a more resilient financial system to address long-term environmental challenges.

(1-A) Carbon credit

A carbon credit is a financial instrument representing the ownership of one ton of carbon dioxide equivalent (CO₂e) emissions, typically issued in the form of certificates or technical approvals. It plays a vital role in supporting climate resilience by incentivizing emission reductions through market-based mechanisms. In Indonesia, the carbon credit market is regulated by a robust legal framework, including the Minister of Environment and Forestry Regulation (Permen LHK) No. 21 of 2022, which provides the legal basis for trading in the Voluntary Carbon Market (VCM). This includes recognized international platforms such as the Verra Registry and the Climate Action Reserve. Further regulatory support is provided by Presidential Regulation (Perpres) No. 98 of 2021 and the Minister of Energy and Mineral Resources Regulation (Permen ESDM) No. 16 of 2022, which together strengthen Indonesia's carbon market architecture and align it with global climate goals.

The carbon credit system addresses the broader challenge of climate resilience (CR) by providing a financial mechanism to incentivize emission reductions. It enables entities exceeding their emission reduction targets to monetize their surplus reductions, creating a tradable asset that supports climate mitigation projects. At the macro level, the feasibility of implementing carbon credit mechanisms is increasingly supported by the global trend toward carbon market integration and the alignment of national climate commitments under frameworks such as the Paris Agreement. These developments signal a favorable environment for carbon trading initiatives. Despite this promising progress, significant obstacles persist. The absence of detailed guidance on carbon tax implementation contributes to regulatory uncertainty for industries, affecting participation and compliance. Furthermore, unclear institutional mandates result in overlapping responsibilities, weakening market oversight and enforcement. Several systemic challenges continue to hinder progress and scalability of carbon credit financing mechanism which include:

- Regulatory inconsistency and institutional fragmentation create uncertainty, inefficiencies, and policy gaps.
- Market volatility hinders pricing stability and long-term investment planning.
- Weak governance and oversight reduce accountability and deter investor confidence.
- Limited infrastructure and an underdeveloped carbon ecosystem constrain efficiency, scalability, and credibility.
- Low public awareness limits participation and demand for carbon credits.

Addressing these challenges requires comprehensive policy reform, capacity building, and the development of robust institutional frameworks to ensure transparency, trust, and long-term success in carbon market participation. To enhance the implementation and effectiveness of carbon credits in Indonesia, it is essential to:

- Strengthen the regulatory and governance framework, ensuring clarity and consistency.
- Improve inter-agency coordination and define institutional roles clearly.
- Expand and develop carbon trading platforms and verification mechanisms.
- Increase public awareness and capacity building for stakeholders.
- Foster more emission reduction projects to ensure a steady supply of tradable credits.

Pilot initiatives in Indonesia:

1. The Cirata Floating Solar Power Plant (operated by Pertamina New & Renewable Energy) in West Java has reduced emissions by 214,000 tons/year as of November 2023.
2. Perhutani's Nature-Based Solutions (NBS) program across nine forest sites has the potential to generate 11.6 million tons of CO₂ credits/year (2022).
3. PT Pertamina Geothermal Energy Tbk (PGEO) has earned USD 747,000 (~IDR 11.2 billion at an exchange rate of IDR 14,995/USD) from the sale of carbon credits generated by its Ulubelu Units 3 & 4 and Karaha Geothermal Power Plants, reducing 1.7 million tons of CO₂ from commercial start until early 2020.

(1-B) Carbon exchange

The Carbon Exchange is a market-based mechanism designed to reduce greenhouse gas emissions by facilitating the trading and reporting of Carbon Units. It directly supports climate resilience and environmental sustainability by creating a structured and transparent system for managing carbon emissions. A major benefit of the carbon exchange lies in its potential to build a regulated and transparent carbon trading environment, which is essential for helping Indonesia meet its emissions reduction targets under international commitments such as the Paris Agreement.

In Indonesia, the carbon exchange mechanism is governed by two key regulations: Financial Services Authority Regulation (POJK) No. 14 of 2023, and Ministry of Environment and Forestry Regulation (Permen LHK) No. 7 of 2023. Indonesia launched the IDX Carbon exchange on September 26, 2023, advancing climate action. By August 2024, it mobilized IDR 6.1 B (EUR 354,2 K) for sustainable energy projects, showcasing its role in driving green tech investment and supporting a low-carbon economy.

Pilot evidence of the exchange's potential is illustrated by key projects, including:

- **PT Pertamina Power Indonesia's** development of two geothermal power plants in North Sulawesi. Construction of 2 Geothermal Power Plants in North Sulawesi Province with emission reduction of more than 200,000 tons of CO₂ per year (2017 - 2020).
- **PT PLN Nusantara Power's** Muara Karang Gas and Steam Power Plant in North Jakarta supports the transition to cleaner energy sources. Construction of Muara Karang Gas and Steam Power Plant in North Jakarta with emission reduction of 927,113 tons of CO₂ per year (2022).

Despite its promise, several challenges hinder the optimal utilization of carbon swaps in Indonesia:

- Limited incentives and financial support for industries to adopt cleaner technologies may slow down the transition to sustainable practices.

- Limited transparency on economic and social impacts for local communities may reduce public trust and hinder support for green projects.

To address these issues, the following actions are recommended:

1. Mobilize investments from sustainability-focused financial institutions to scale up the deployment of green technologies.
2. Enhance international cooperation to expand access to resources, expertise, and low-emission technologies for climate mitigation.
3. Disclose impact reports covering carbon and community benefits to boost accountability and trust.

(1-C) Carbon offset

Carbon Offset is a financial instrument that enables businesses and individuals to compensate for their carbon emissions by purchasing carbon credits from projects designed to reduce or eliminate emissions. These projects can range from reforestation and afforestation to renewable energy initiatives. It plays a critical role in supporting the sustainability of climate resilience by facilitating the achievement of global and national climate targets. In Indonesia, carbon offsets are governed by two key regulations: Regulation of the Minister of Environment and Forestry (Permen LHK) No. 20 of 2022, and Financial Services Authority (POJK) Regulation No. 15 of 2023.

Carbon offsets allow companies and governments to purchase offsets from projects in developing regions or sectors with limited local abatement capacity, providing flexibility to meet climate goals. When paired with rigorous standards and monitoring systems, carbon offsets can be an effective tool for achieving global climate targets while maintaining environmental integrity and preventing fraud.

The key stakeholders involved in carbon offset initiatives in Indonesia include the Ministry of Environment and Forestry (KLHK) and private sector companies engaged in offset projects. While specific financial data regarding the mobilization of carbon offsets in Indonesia is not currently available, the role of this instrument in the nation's carbon reduction strategy is widely recognized.

The role and challenges of carbon offset in Indonesia such as:

- Primary Goals: Invest in emission reduction through forest and biodiversity conservation.
- Contribution to CR: Supports funding for sustainable practices in regions that need it, while helping reduce emissions.
- Key Benefit: Integrates environmental conservation efforts with emission reduction strategies.
- Challenges: High verification costs and weak local monitoring hinder broader adoption, especially for small businesses.

Challenges: High verification costs and weak local monitoring hinder broader adoption, especially for small businesses.

Notable pilot evidences

The GoGreener program by PT GoTo, launched in 2021 in collaboration with Jejak.in, serves as notable pilot evidence of private sector-led carbon offsetting. Over one million users contributed to the planting of 300,000+ trees across 340 locations, enhancing biodiversity and absorbing an estimated 1,573 tCO₂e.

Despite the progress, several challenges continue to undermine the full potential of carbon offsets in Indonesia:

- Verification and transparency issues surrounding offset projects create skepticism about their effectiveness and reliability.
- Impact reporting must be improved to ensure that carbon credits genuinely represent legitimate emissions reductions and do not suffer from issues like double counting (Smith, 2019; Brown et al., 2021).
- Ensuring that offset projects are transparent, rigorously monitored, and subject to effective certification systems is critical to maintaining the integrity of the carbon market.

These challenges show the need for stronger regulation, transparency, and oversight in Indonesia's carbon offset framework to ensure credibility and impact.

(1-D) Payment for environmental services (PES)

Payment for Ecosystem Services (PES) is a mechanism that links upstream and downstream stakeholders by providing financial incentives to those who help sustain ecosystem services, especially in water resource management. It promotes environmental and climate resilience by engaging local communities as stewards of natural resources. PES has also shown potential in reducing poverty, particularly when it targets poor resource managers in upstream areas. Its impact is influenced by participation rates and the value of compensation. PES is applied primarily at the meso level, focusing on the management of landscape ecosystems (Ls). A pilot project of PES implementation in Indonesia is the protection of the Cidanau Watershed in Banten showcases a successful PES initiative. This project show local communities, government, and private companies like PT Krakatau Tirta Industri work together to preserve forests and secure clean water supply through compensation-based environmental stewardship. This initiative aligns with several regulations designed to support sustainable watershed management, such as:

- **Government Regulation No. 37 of 2012** concerning Watershed Management, which provides technical guidelines for involving stakeholders in improving environmental sustainability in watershed areas.
- **Law No. 32 of 2009** on Environmental Protection and Management, which outlines general principles of environmental governance.
- **Minister of Environment and Forestry Regulation No. 83/2016** concerning Community-Based Forest Management, which establishes frameworks for engaging local communities in forest conservation and sustainable land management practices.

Enabling factors and challenges in scaling PES implementation such as:

- **Incentive Mechanism:** Farmers and residents receive direct compensation for maintaining forests and protecting watersheds, making conservation economically viable.
- **Benefit:** PES helps ensure water quality, prevents erosion, and empowers communities through sustainable income opportunities.
- **Challenges:** Limited funding and the absence of strong legal frameworks can hinder long-term commitments and broader implementation of PES programs.

(1-E) REDD+ (Reducing Emissions from Deforestation and Forest Degradation Plus)

REDD+ is a global mechanism designed to slow deforestation through performance-based payments for emission reductions to developing countries. It was first developed in 2005 under the United Nations Framework Convention on Climate Change (UNFCCC). This instrument directly supports the sustainability of landscape and climate resilience. When implemented at the national (or sub-national) level, efforts are made to close this gap by integrating the project into the national REDD+

program (Freund et al., 2024). Furthermore, REDD+ functions as an international multilevel system of conditional and performance-based payments for environmental services (PES) (Wunder et al., 2024).

In Indonesia, the Ministry of Environment and Forestry (KLHK) plays a central role in managing and supervising the implementation of REDD+, while the Environmental Fund Management Agency (BPDHLH) is responsible for managing funds related to REDD+. The REDD+ instrument targets not only the reduction of carbon emissions but also supports biodiversity conservation, forest rehabilitation, and strengthening local capacity to maintain ecosystems. Similar to PES, REDD+ primarily focuses on landscape (Ls) ecosystems and is applied at the meso level.

Regulations related to REDD+ in Indonesia include the Ministry of Environment and Forestry Regulation (Permen LHK) Number 70 of 2017, which outlines procedures for reducing emissions from deforestation and forest degradation, and Permen LHK Number 71 of 2017, which addresses the implementation of the National Registry System for Controlling Climate Change. These regulations specifically govern the implementation of REDD+ in Indonesia.

The Katingan-Mentaya Project in East Kalimantan is a 149,800 ha peatland conservation initiative. This project showcases how REDD+ can effectively reduce deforestation by partnering with local governments and Indigenous communities while channeling international funding to support forest protection and community sustainability.

The implementation of REDD+ in Indonesia faces several key challenges and strategic considerations. Primarily, REDD+ is especially relevant for regions with critical forest ecosystems, which serve as vital carbon sinks and biodiversity hotspots. However, its operationalization is hindered by significant barriers, including high costs and limited local capacity for effective management and monitoring. Despite these obstacles, there is notable potential for scalability through improved coordination among stakeholders and more efficient use of resources, which can enhance the overall impact of REDD+ initiatives. A fundamental conflict remains, however, as efforts to protect forests often clash with local economic activities such as agriculture and logging, necessitating strategies that carefully balance environmental conservation with the socio-economic needs of local communities.

(1-F) Sustainable and responsible investment (SRI)

Sustainable and Responsible Investment (SRI) in Indonesia integrates ethical, social, and environmental considerations into financial decision-making, aiming to promote sustainable business practices that deliver positive social and environmental outcomes alongside financial returns. This mechanism directly supports the sustainability of landscapes and biodiversity. The implementation of SRI is underpinned by a robust regulatory framework. Notably, OJK Regulation No. 51 of 2017 provides guidelines for sustainable finance for financial institutions, issuers, and public companies, encouraging businesses to adopt ESG (Environmental, Social, and Governance) principles. Additionally, POJK No. 18 of 2023 outlines the issuance and requirements for sustainable bonds and sukuk, ensuring that debt securities align with sustainability goals. Complementing this, POJK No. 60/POJK.04/2017 offers specific guidelines for issuing green bonds to fund environmentally sustainable projects. These regulations form the backbone of Indonesia's efforts to promote sustainable finance. Key institutions such as the Financial Services Authority (OJK), the Ministry of Finance, and the Indonesia Stock Exchange (IDX) play crucial roles in advancing SRI practices across various sectors. The SRI strategy focuses on landscape, seascape, biodiversity, and climate resilience. By ensuring investments create positive, long-lasting impacts on ecosystems and society, this strategy is implemented at both meso and micro levels. Large-scale initiatives address ecosystem protection, while small-scale projects target community-based and local business efforts. This dual approach enables flexibility, allowing for tailored solutions that optimize the overall impact of sustainable investments.

Successful pilot projects, such as the IDX ESG Leaders Index and the SRI-KEHATI Index, serve as benchmarks for sustainability among companies listed on the Indonesia Stock Exchange. Moreover,

PT Bank Central Asia Tbk (BCA) has shown its commitment to SRI principles through its Endowment Fund, launched in 2016, underscoring the successful integration of sustainability principles into financial management practices.

The SRI strategy offers substantial benefits, including enhancing corporate reputation through the adoption of ESG principles, attracting international investors focused on sustainability, and driving long-term economic growth. However, challenges remain, such as the lack of effective tools to measure sustainability outcomes and the relatively lower financial returns compared to traditional investments, which may deter some investors.

Funding for the SRI strategy has grown significantly, with the capitalization of the SRI-KEHATI Index (comprising 25 companies) reaching USD 30.9 billion in 2024. This growth demonstrates strong investor commitment to sustainability-driven projects and highlights the potential of sustainable investments to contribute to both economic and environmental resilience. By leveraging this momentum, the SRI strategy stands as a vital instrument in advancing Indonesia's sustainable development goals while addressing pressing environmental and social challenges.

(1-G) Environmental, social, and governance (ESG) funds

ESG Funds focus on incorporating sustainability criteria into the investment strategies of private companies, aiming to align corporate practices with environmental, social, and governance (ESG) goals. This approach not only promotes responsible business conduct but also attracts investors seeking sustainable growth and ethical investments. In Indonesia, there is a growing emphasis on integrating sustainability into corporate strategies, encouraging businesses to align with ESG objectives while appealing to investors focused on ethical and long-term development.

This investment approach is supported by key regulations such as Presidential Regulation No. 18 of 2020, which outlines the National Medium-Term Development Plan (RPJMN) 2020–2024 with a strong focus on sustainable development, and Law No. 40 of 2007, which governs corporate transparency and accountability.

The scope of ESG Investment Funds spans landscapes (LS), seascapes (SS), biodiversity (Bd), and community resilience and development (CRD). These funds prioritize projects that promote environmental sustainability, conserve biodiversity, and support local communities, while also encouraging responsible corporate behavior.

Implementation occurs at both the meso and micro levels. At the meso level, investments are directed toward mid-scale initiatives such as green infrastructure projects, sustainable real estate, and renewable energy development. At the micro level, ESG investments support local businesses, community-based initiatives, and venture capital for startups that prioritize ESG principles, fostering sustainable practices at the grassroots level.

Pilot evidence from Indonesia demonstrates the successful adoption of ESG principles. ESG-based Mutual Funds are mutual funds that integrate environmental, social, and governance principles, with AUM surpassing USD 196 M, reflecting responsible financial growth.

However, challenges remain—chief among them is the absence of comprehensive regulation on ESG reporting, which is still in the early stages of development. This regulatory gap may lead to inconsistencies in ESG disclosures and performance measurement. As of 2024, the assets under management (AUM) for ESG-based mutual funds in Indonesia exceeded USD 196 million, reflecting a significant rise in sustainability-driven investments. This growth highlights increasing investor awareness of ESG principles and underscores the expanding role of ESG Investment Funds in advancing Indonesia's sustainable development goals.

4.2.2 Sustainable government financing

Sustainable Government Financing refers to government-led funding mechanisms beyond the state budget that support environmentally sustainable projects. It aims to promote a green economy by financing initiatives that reduce carbon emissions, preserve biodiversity, and enhance resource efficiency while ensuring long-term ecological balance (OJK, 2024). In Indonesia, several instruments of Sustainable Government Financing have been implemented, including green bonds and sukuk, blue bonds, and coral bonds. Table 4.3 provides a detailed breakdown of these instruments.

Table 4.3 Instruments of the sustainable government financing

Code	Instrument name	Description	Supporting regulation	Object focus	Scope
2-A	Green Bonds/Sukuk	Debt securities whose proceeds are used to finance or refinance environmentally sound business activities	POJK No. 60 /POJK.04/2017	Ls, Bd, CR	Macro
2-B	Blue Bonds/Sukuk	Debt securities issued to raise capital specifically for the implementation of Sustainable Development Goals (SDGs) related to the oceans, seas, and marine resources, as well as to support the transition toward a sustainable ocean economy.	• UU No. 32 of 2009 • PP No. 60 of 2007 • UU No. 1 of 2014 • Permen KP No. 30 of 2016	Ss, Bd, CR	Macro
2-C	Coral Bonds	An innovative debt financing instrument designed to enhance ocean biodiversity and manage Marine Protected Areas (MPAs)	POJK No. 60 /POJK.04/2017	Ss, Bd, CR	Macro

The sustainable government financing mechanism is becoming increasingly critical in light of the growing urgency to address global environmental challenges such as climate change, biodiversity loss, and pollution—issues that threaten planetary stability and long-term prosperity. In response, governments around the world are adopting a variety of strategic approaches, utilizing a diverse set of financial instruments managed by relevant ministries and supervisory institutions. These instruments are designed to promote sustainable development, safeguard environmental resources, and mitigate climate-related risks.

(2-A) Green bonds/Sukuk

Green Bonds (2-A) are debt securities whose proceeds are allocated to finance or refinance environmentally sustainable business activities (OJK, 2017). This instrument directly supports the sustainability of landscapes (Ls), biodiversity (Bd), and climate resilience (CR) with financing typically applied at macro levels to support large-scale environmental initiatives.

The regulatory foundation for green bonds in Indonesia is established under The Financial Services Authority Regulation (POJK) No. 60 of 2017 regulates the issuance and requirements of green bonds in Indonesia, specifically for financing projects related to climate change mitigation and adaptation, natural resource conservation, and renewable energy development.

Green bonds/sukuk are increasingly used worldwide to support low-carbon transitions. In Indonesia, they fund reforestation, renewable energy, and waste and water management to boost sustainability and environmental benefits. Pilot initiatives in Indonesia's green bond market demonstrate the potential and tangible impact of this financial instrument. In 2018, PT Sarana Multi Infrastruktur (SMI) issued Indonesia's first green bond, directing proceeds to renewable energy, energy efficiency, water and waste management, and sustainable transportation projects. This milestone was followed by PT Bank Negara Indonesia (BNI) in 2019, which issued green bonds to finance similar initiatives. Moreover, PT Perusahaan Listrik Negara (PLN) launched green bonds to support the development of renewable energy infrastructure, including solar and wind power plants.

Data from the Asian Development Bank (ADB) reflects the growth trajectory of Indonesia's green bond market. In 2017, green bond issuance totaled a modest US\$49 million, solely from corporate issuers. By 2018, the market had expanded dramatically to US\$1.8 billion, with US\$1.25 billion issued by the government and US\$653 million by corporations. As of March 2022, the cumulative value of green bonds issued in Indonesia reached US\$7 billion, comprising US\$4.05 billion from the government and US\$3 billion from corporate issuers. This rapid growth has positioned Indonesia as the second-largest green finance market in ASEAN, highlighting its significant role in advancing sustainable finance and environmental stewardship in the region.

This rapid growth has positioned Indonesia as the second-largest green finance market in ASEAN, highlighting its significant role in advancing sustainable finance and environmental stewardship in the region. The Government of Indonesia has utilized green sukuk—Sharia-compliant sovereign instruments—as the primary tool to raise financing for sustainable development goals. Green sukuk pursue the same environmental objectives as green bonds while adhering to Islamic finance principles, making them especially attractive in markets with strong demand for Sharia-compliant investments. Their regulatory foundation is supported by The Minister of Finance Regulation (PMK) No. 60/PMK.08/2017 regulates the issuance and accountability of green sukuk, complementing POJK No. 60 of 2017 and provisions in the State Budget Law.

Indonesia made history in 2018 by issuing the world's first sovereign green sukuk, raising US\$1.25 billion to finance projects in renewable energy, energy efficiency, climate-resilient infrastructure, waste and water management, and sustainable transportation. Since then, the government has continued to issue green sukuk on an annual basis, including both global sukuk and domestic retail sukuk (Green Retail Sukuk/SR). Retail offerings such as SR014 and SR015 have gained increasing traction among individual investors, reflecting growing public interest in sustainable and Sharia-compliant financial products.

Green sukuk provides several strategic advantages. By combining environmental objectives with Islamic financial principles, they offer access to a broader investor base—spanning both sustainability-focused and faith-based investors—domestically and internationally. Additionally, sovereign backing enhances investor confidence and enables more competitive pricing compared to other instruments. These sukuk also underscore Indonesia's dual commitment to advancing climate action and promoting the Islamic economic system. Despite their promise, the issuance and development of green sukuk faces several challenges. These include high issuance and third-party verification costs, a limited pipeline of green-certified projects, and the complexity of meeting dual standards—both environmental and Sharia compliance. Furthermore, as with green bonds, access to green sukuk financing remains limited for smaller-scale initiatives and MSMEs, given the typically large scale and structured nature of sukuk offerings.

(2-B) Blue bonds/Sukuk

Blue Bonds (2-B) are debt securities issued to raise capital specifically for the implementation of Sustainable Development Goals (SDGs) related to the oceans, seas, and marine resources, as well as to support the transition toward a sustainable ocean economy (Matthew & Robertson, 2021). These instruments directly contribute to the sustainability of seascapes (Ss), biodiversity (Bd), and climate resilience (CR) with financing typically applied at macro levels to support large-scale marine and coastal conservation initiatives.

The issuance of blue bonds in Indonesia is regulated by Law No. 32 of 2009, PP No. 60 of 2007, Law No. 1 of 2014, and Ministerial Regulation No. 30/PERMEN-KP/2016, which collectively govern marine ecosystem conservation and support sustainable blue economy financing.

Blue bonds focus on funding projects such as mangrove ecosystem restoration, the establishment of marine protected areas, and efforts to mitigate threats to marine biodiversity, including overfishing and pollution. As a pilot initiative, Indonesia launched its first Blue Bond in May 2023 in Japan, successfully raising ¥20.7 billion (approximately US\$150 million). The issuance included two tranches with 7-year and 10-year maturities, offering coupon rates of 1.20% and 1.43%, respectively. The proceeds are being used to strengthen Indonesia's blue economy through coastal protection, sustainable fisheries and aquaculture, marine biodiversity conservation, and mangrove rehabilitation.

(2-C) Coral bonds

Coral Bonds (2-C) are innovative debt instruments designed to enhance ocean biodiversity and support the management of Marine Protected Areas (MPAs). They contribute to the sustainability of seascapes (Ss), biodiversity (Bd), and climate resilience (CR) by channeling private capital into urgent marine conservation efforts. Launched by the World Bank in collaboration with the Government of Indonesia, IUCN, the Global Environment Facility (GEF), and BNP Paribas, the initiative aims to improve coral reef health and promote sustainable economic activities, particularly in fisheries and tourism. Financing is typically applied at the macro level to support large-scale marine ecosystem restoration and management.

In Indonesia, Coral Bonds are not yet governed by a specific regulatory framework but are indirectly supported by POJK No. 60 of 2017 on Green Bonds, which provides a general legal basis for environmental financing. This regulation covers transparency and accountability but does not fully address the unique needs of Coral Bonds, which fund projects like coral reef restoration, marine biotechnology, and sustainable ecotourism to rehabilitate marine ecosystems and support coastal resilience.

The issuance of Coral Bonds demonstrates Indonesia's leadership in sustainable marine conservation. Notably, the Coral Bond builds on the success of the World Bank's 2022 Wildlife Conservation Bond (also known as the "rhino bond"), which links investor returns to measurable conservation outcomes. Similarly, the Coral Bond seeks quantifiable improvements in reef health and fisheries sustainability across more than 5 million hectares of MPAs. These initiatives are further supported by broader conservation investments, such as the World Bank's US\$200 million Oceans for Prosperity project, aligning with global commitments to protect 30% of the world's land and oceans by 2030.

Advantages of Coral Bonds include their potential to promote marine ecosystem restoration, particularly coral reefs, while also stimulating sustainable tourism and coastal livelihoods. However, several challenges remain, including limited investor awareness and education, high implementation costs and associated risks, and absence of specific regulatory frameworks tailored to Coral Bonds.

4.2.3 Sustainable private based financing

Sustainable private-based financing is an investment strategy that leverages private commercial funding while incorporating environmental, social, and governance (ESG) considerations into business decision-making (Dongna et al., 2022). This approach aims to foster sustainable and ethical business practices, with a continued emphasis on profitability and commercial success. While ESG principles have been adopted across various non-corporate sectors, this study specifically examines ESG instruments utilized within the business sector.

In Indonesia, a range of financial instruments has been developed to support the implementation of sustainable private-based financing. These instruments are vital in promoting sustainability by providing the financial mechanisms necessary to drive long-term environmental stewardship and economic growth. Table 4.4 offers a comprehensive overview of the key instruments applied under this financing model.

Table 4.4 Instruments of the sustainable private based financing

Code	Instrument name	Description	Supporting regulation	Object focus	Scope
3-A	Blue Loans/ Investment	Blue loans finance marine sustainability efforts, including plastic reduction, ecosystem restoration, and offshore renewable energy.	• UU No. 32 of 2009 • PP No. 60 of 2007 • UU No. 1 of 2014 • Permen KP No. 30 of 2016	Ss, Bd, CR	Meso and Micro
3-B	Green Loans/ Investment	Green loans finance eco-friendly projects like renewable energy and waste management, aiming to promote sustainability and boost efficiency.		Ls, CR	Meso and Micro
3-C	Water Credit	Microfinance instrument that finances clean water and sanitation infrastructure for marginalized communities.		Ss, CR	Micro
3-D	Climate Fund	A Climate Fund refers to a financial mechanism specifically designed to mobilize and allocate resources toward initiatives that mitigate climate change and		CR	Meso, Micro

		enhance environmental sustainability.			
3-E	Impact Investment	Impact investment aims to generate measurable social and environmental benefits along with financial returns.		Ls, Ss, Bd, CR	Meso, Micro
3-F	Sustainable supply chain finance	Financing that prioritizes sustainability throughout the production chain.	POJK No.51 of 2017	Ls, Bd, CR	Meso & Micro
3-G	Corporate Green Bond/Sukuk	Debt instruments issued by corporate or state-owned enterprises to raise capital for financing or refinancing environmentally sustainable business activities	● POJK No. 18 of 2023 ● POJK No. 10 of 2024 ● MUI: 32/DSN-MUI/IX/2002	SS, Bd, CR	Macro
3-H	Corporate Blue Bond/Sukuk	Issued by corporate entities, including state-owned enterprises, to fund marine-related activities aligned with SDG 14 (Life Below Water).	● Law No. 32/2009 ● Law No. 1/2014 ● Ministerial Regulation No. 30/2016 ● OJK Regulation No. 18 of 2023	SS, Bd, CR	Macro

Sustainable Private-Based Financing is increasingly vital as investors acknowledge the material risks of environmental, social, and governance (ESG) factors, directing capital toward entities that uphold sustainable and ethical principles. Transparency and accountability, as emphasized by Manjiao (2023), are central to influencing corporate behavior toward socially responsible outcomes. International frameworks such as the IFC Performance Standards, the Equator Principles, and the UN Principles for Responsible Investment (UN PRI) offer structured guidance for managing ESG risks in private financing. Through adherence to these standards, Sustainable Private-Based Financing fosters long-term value creation for both businesses and society.

(3-A) Blue loans/investment

Blue Loans are specialized financing instruments designed to support investments that promote the sustainability of marine ecosystems. These instruments directly contribute to the preservation of seascapes (Ss), biodiversity (Bd), and climate resilience (CR). Blue Loans fund initiatives such as reducing ocean plastic pollution, restoring marine ecosystems, promoting offshore renewable energy, encouraging sustainable shipping practices, and fostering eco-friendly tourism. Financing is

typically applied at meso and micro levels, targeting both medium-scale infrastructure and community-based initiatives. As a part of broader sustainable finance strategies, Blue Loans play a crucial role in maintaining the health and sustainability of marine and aquatic environments.

The implementation of Blue Loans in Indonesia is regulated by Law No. 32/2009, PP No. 60/2007, Law No. 1/2014, and Ministerial Regulation No. 30/2016, which govern marine conservation and coastal area management. These regulations support financing for projects focused on seascape restoration, biodiversity, and climate resilience, ranging from large-scale renewable energy to community-based initiatives like ecotourism and marine conservation.

A notable example of this financing mechanism is the certified Blue Loan issued by the Asian Development Bank (ADB) to PT ALBA Tridi Plastics Recycling Indonesia. This USD 44.20 million investment supports the development of a plastic recycling facility in Central Java. The initiative aims to reduce ocean plastic pollution through improved waste management, protect marine ecosystems through responsible waste processing, and boost the blue economy by advancing sustainable recycling practices.

Blue Loans offer several benefits, including financial support for marine-focused projects and the promotion of sustainable practices within maritime industries. However, challenges persist, particularly regarding limited access for MSMEs and the underdeveloped financial ecosystem for marine-related ventures, which hinder the scalability of such financing. Nevertheless, Blue Loan initiatives continue to gain traction, with increasing support from both international and domestic financial institutions. These collaborations are driving investments in marine ecosystem restoration and renewable energy, marking a promising shift in the sustainability-focused financial landscape.

(3-B) Green loans/investment

Green Loans, also known as green credit, are financing mechanisms designed to direct credit resources towards environmentally friendly projects, such as renewable energy, waste management, and green infrastructure. This instrument directly supports the sustainability of landscapes (Ls) and climate resilience (CR). Green Loans aim to encourage green economic growth, support enterprise transformation, and improve production efficiency. Financing is generally applied at meso and micro levels, targeting both medium-sized enterprises and local community-based green initiatives.

Green loans are supported by comprehensive regulations, including the The Financial Services Authority Regulation (POJK) No. 51/POJK.03/2017 regulates the implementation of sustainable finance, requiring financial institutions to incorporate sustainability principles into their operations, including the provision of green loans.

The objective focus of Green Loans is centered on Landscape and Climate Resilience, addressing projects that reduce carbon emissions, improve waste management, and promote renewable energy use. Green Loans operate on Meso and Micro Levels, offering flexible financing solutions for medium- and small-scale projects aligned with sustainability goals. Pilot evidence showcases several successful implementations, including:

1. BTN Green KPR, providing mortgages for environmentally friendly homes certified as green buildings.
2. BRI Sustainable Credit allocated IDR 750.91 (EUR 43.6 B) trillion to ESG-compliant projects by Q3 2023, reflecting the increasing trend of green financing among Indonesian banks.

The advantages of Green Loans include improved access to funding for green projects and flexibility in terms compared to traditional bonds. However, high credit risks for banks and limited understanding of green financing benefits among borrowers remain barriers to broader adoption.

As of 2021, the total accumulated green loan funding reached an impressive USD 61.24 billion. Green loans primarily support projects in renewable energy, energy efficiency, sustainable

infrastructure, and other environmentally friendly initiatives. Thus, this financing mechanism plays a crucial role in driving the global transition toward a low-carbon economy and supporting the achievement of SDGs. Financial institutions are increasingly committing to green financing, recognizing its importance in promoting climate resilience and environmental sustainability.

(3-C) Water credits

Water Credits represent an innovative microfinance solution designed to improve access to clean water and sanitation infrastructure, particularly for underserved and marginalized communities. This financial instrument directly supports the sustainability of seascapes (Ss) and climate resilience (CR). Financing is applied at the micro level, enabling individual households or small community groups to fund essential water and sanitation projects. By empowering local beneficiaries, Water Credits contribute to improved public health, social equity, and infrastructure development at the grassroots level.

The regulatory framework supporting Water Credits includes Law (UU) No. 32/2009 on Environmental Protection and Management, Government Regulation (PP) No. 60/2007, and Ministerial Regulation (Permen KP) No. 30/2016, which collectively emphasize the importance of sustainable water resource management.

The object focus of Water Credits includes Seascape and Climate Resilience, with specific attention to improving clean water access and sanitation solutions in vulnerable areas. Water Credits are implemented primarily at the Micro Level, addressing the needs of individual households and rural communities. Pilot evidence includes initiatives such as:

1. Water.org's partnership with Bank Negara Indonesia (BNI), which provides small loans for clean water and sanitation projects, enables underserved households to build critical infrastructure.
2. Performance-based payment models in West Java, where communal sanitation facilities are maintained through usage-based fees, ensuring their operational sustainability.

Advantages of Water Credits include affordable financing for sanitation projects and greater inclusion of underserved regions. However, challenges such as limited financial structures tailored to specific community needs and logistical issues in rural areas hinder widespread adoption. The cumulative funding for Water Credits reflects a growing interest in inclusive financing mechanisms, with collaborations between NGOs, banks, and local governments driving progress in water and sanitation infrastructure development.

(3-D) Climate fund

The Climate Fund is a financial mechanism specifically designed to mobilize and allocate resources toward initiatives that mitigate climate change and enhance environmental sustainability (UNFCCC, 2023). This instrument directly supports climate resilience (CR) by channeling funds into projects that reduce greenhouse gas emissions, promote circular economy principles, and strengthen ecosystem resilience. Financing is applied at meso and micro levels, supporting both regional initiatives—such as community-based adaptation programs and local infrastructure upgrades—and smaller-scale interventions tailored to specific local needs.

The regulatory framework for the Climate Fund is supported by POJK No. 60/POJK.04/2017 on Green Bonds, which ensures that funds are allocated to environmentally sustainable projects, and POJK No. 51/POJK.03/2017, which mandates financial institutions to integrate sustainability principles into investments. Additionally, Law No. 32/2009 on Environmental Protection and Management provides a broader framework to align climate financing with national and international environmental commitments.

The implementation of the Climate Fund spans multiple levels—macro, meso, and micro. At the macro level, funds are allocated to large-scale infrastructure projects such as renewable energy

development, carbon sequestration programs, and ecosystem restoration. At the meso level, financing supports corporate sustainability programs, enabling businesses to transition toward low-carbon operations and reduce their environmental impact. At the micro level, targeted funding empowers local stakeholders to implement community-based climate adaptation strategies, sustainable agricultural practices, and nature-based solutions.

A notable example of the Climate Fund's effectiveness is the Unilever Climate & Nature Fund, which has pledged €1 billion by 2030 to support projects that drive climate action, conserve biodiversity, and enhance resource efficiency. This initiative underscores the growing commitment of multinational corporations to embed environmental sustainability into their financial strategies and reinforces the alignment of private sector investments with global climate goals.

Despite its significant advantages, the Climate Fund faces several challenges. Limited access to financing for small-scale projects, particularly in developing economies, remains a major barrier to widespread adoption. Regulatory uncertainties surrounding long-term climate finance policies also introduce risks that may deter potential investors. Additionally, financial risks associated with climate-related investments—such as volatile carbon credit markets and uncertain return-on-investment (ROI)—necessitate the implementation of robust risk management frameworks to boost investor confidence.

Nevertheless, the Climate Fund remains an indispensable tool for accelerating the global transition toward a low-carbon and climate-resilient economy. By fostering collaboration among financial institutions, governments, and private sector actors, this financing mechanism has the potential to mobilize large-scale investments in transformative climate solutions—ultimately advancing international climate commitments and sustainable development objectives.

(3-E) Impact investment

Impact investment refers to financial capital allocated with the dual objective of generating measurable social and environmental outcomes alongside financial returns (GIIN, 2023). This financing instrument directly contributes to the sustainability of landscapes (Ls), seascapes (Ss), biodiversity (Bd), and climate resilience (CR). Unlike conventional investment models that prioritise profit maximisation, impact investment emphasises alignment with the Sustainable Development Goals (SDGs), ethical business conduct, and long-term ecological restoration. The scope of impact investment spans diverse sectors, with landscape conservation, biodiversity protection, resource efficiency, and climate resilience serving as its primary focal areas. At the meso level, impact investments support socially responsible enterprises, fostering business models that integrate environmental stewardship with economic profitability. Meanwhile, at the micro level, financial resources empower local communities to develop eco-friendly livelihoods, adopt regenerative agricultural practices, and enhance climate adaptation strategies.

The regulatory framework for impact investment in Indonesia is governed by POJK No. 51/POJK.03/2017, which mandates financial institutions to integrate environmental and social considerations into their decisions. Law No. 41/1999 on Forestry regulates investments in afforestation, land rehabilitation, and forest conservation, while Government Regulation No. 46/2017 supports sustainable financing through environmental economic instruments.

A compelling real-world example of impact investment in action is the Yayasan Bambu Lingkungan Lestari (YBL) Restoration Economy Program, which collaborates with international foundations and corporate entities to reforest degraded lands and transform them into sustainable resources. This initiative highlights the tangible impact of mission-driven investment models, demonstrating how financial capital can be leveraged to simultaneously combat environmental degradation and enhance socio-economic well-being.

While the advantages of impact investment are substantial, challenges remain. Limited access to financial resources for early-stage ventures is a significant obstacle, as many small-scale initiatives

struggle to secure initial funding despite their high potential for social and environmental impact. Moreover, higher project risks—such as unpredictable returns, regulatory complexities, and the long-term nature of environmental initiatives—pose difficulties for investors seeking short-term financial gains. In addition, the need for rigorous impact assessment and transparent reporting mechanisms is essential to ensure that investments genuinely contribute to sustainable development, rather than serving as a form of “greenwashing.”

Despite these challenges, impact investment continues to gain momentum as financial institutions, corporations, and Donor and Philanthropic organizations increasingly recognize its potential to drive systemic change and create shared value. As global financial markets shift toward sustainable and responsible investing, impact investment is poised to play a pivotal role in shaping a more inclusive, resilient, and environmentally conscious economic future.

(3-F) Sustainable supply chain finance (SSCF)

Sustainable Supply Chain Finance (SSCF) refers to financial practices that support trade transactions while promoting environmental, social, and economic sustainability across supply chains. It incentivizes suppliers to adopt circular and eco-friendly practices, integrate sustainability into core business operations, and reduce resource waste. SSCF plays a vital role in fostering low-carbon, efficient production systems by aligning financing with sustainable procurement and supply chain goals.

Furthermore, SSCF directly supports the sustainability of landscapes (Ls), biodiversity (Bd), and climate resilience (CR) through applications in agriculture, food and beverage, and textiles. Operating at meso and micro levels, SSCF enables both sector-wide transformation and access to finance for small producers, contributing to inclusive green growth and climate change mitigation within global and local supply chains.

In Indonesia, SSCF implementation is supported by POJK No. 51/POJK.03/2017, which requires companies to adopt sustainable practices, including financing for environmentally friendly supply chains.

A notable example of successful SSCF implementation is the Unilever Sustainable Living Plan (USLP), launched in 2010. The program aims to improve the health and well-being of more than one billion people, reduce the environmental footprint of Unilever’s products by half, and improve the livelihoods of millions through business growth. Under the SSCF mechanism, large companies such as Unilever provide incentives to suppliers that meet sustainability criteria—for example, offering low-interest financing for investments in green technologies.

The potential for SSCF development in Indonesia is considerable, given the dominance of SMEs in the national supply chain. However, key challenges include limited access to finance for SMEs and gaps in technological capacity. Further development can be pursued by strengthening partnerships with microfinance institutions and offering technical training for suppliers.

(3-G) Corporate green bonds/sukuk

Corporate green bonds/sukuk are debt instruments issued by corporate or state-owned enterprises to raise capital for financing or refinancing environmentally sustainable business activities. These instruments mirror their sovereign counterparts in structure and regulatory requirements but differ primarily in the issuing entity—being driven by private sector actors rather than the government. Indonesia has established a robust regulatory framework to support the development of sustainable financing instruments, including green bonds and sukuk. Regulation POJK No. 18 of 2023 provides comprehensive guidelines for the issuance of thematic bonds and sukuk, encompassing corporate green bonds aimed at financing environmentally sustainable projects. Additionally, POJK No. 10 of 2024 governs the issuance of regional bonds and regional sukuk, enabling local governments to access capital market financing through these instruments. Furthermore, the DSN-MUI Fatwa Number 32/DSN-MUI/IX/2002 offers a Shariah-compliant legal foundation for sukuk issuance,

thereby enhancing investor confidence and market participation in accordance with Islamic financial principles.

Pilot evidence from Indonesia's financial sector illustrates early adoption of corporate green bond instruments to support sustainable development. For instance, PT Sarana Multi Infrastruktur (PT SMI) issued the country's first green bond in 2018, financing projects in renewable energy, energy efficiency, water and waste management, and sustainable transportation. Following this, PT Bank Negara Indonesia (PT BNI) issued green bonds in 2019 to back sustainability-aligned initiatives, including energy and waste management projects. Similarly, PT Perusahaan Listrik Negara (PT PLN) has launched green bonds aimed at expanding renewable energy infrastructure, such as solar and wind power plants. These cases demonstrate Indonesia's emerging experience in leveraging capital market instruments for environmental objectives.

Despite the promising potential of private green bonds and sukuk as instruments to finance sustainable development, their widespread adoption in Indonesia remains constrained by several notable challenges. Structural barriers, including high issuance and verification costs, coupled with a limited pipeline of green-certified projects, have significantly hindered market growth. Moreover, persistent issues related to market trust arise from investor concerns about greenwashing and the lack of transparency in reporting and verification processes. To overcome these obstacles and enhance corporate participation, strategic enablers are essential. These include the development and adoption of standardized frameworks, comprehensive investor education programs, and strengthened public-private partnerships. Together, such measures can provide the necessary foundation to scale up the green finance market and unlock its full potential for environmental impact.

(3-H) Corporate blue bonds/sukuk

Corporate blue bonds/sukuk are debt instruments issued by private companies or state-owned enterprises to finance or refinance marine-related projects. These may include ocean conservation, sustainable fisheries, or marine pollution reduction and are aligned with the Sustainable Development Goals (SDGs), especially SDG 14: Life Below Water. These instruments help mobilize corporate capital for ocean sustainability while offering investors both financial returns and measurable environmental impact.

Indonesia has developed a supportive regulatory framework to facilitate the issuance of Corporate Blue Bonds and Sukuk, which are designed to finance marine and coastal conservation efforts. Key legal foundations include Law No. 32 of 2009, which emphasizes environmental protection, and Law No. 1 of 2014, which specifically addresses the management of coastal areas and small islands. Complementing these laws, Ministerial Regulation No. 30 of 2016 establishes zoning for marine protected areas, providing critical guidance for sustainable marine resource management. Furthermore, the Financial Services Authority Regulation No. 18 of 2023 offers interim provisions for Corporate Blue Bond and Sukuk issuance, including criteria for eligible projects, requirements for impact assessment, and reporting standards, pending the development of dedicated blue finance regulations. While sovereign issuances have led, corporate blue bonds/sukuk remain unrealized in Indonesia. Strategic entry points include aquaculture, marine ecotourism, blue carbon, and climate-resilient ports—sectors where profit aligns with marine sustainability.

Fundamental components for the effective deployment of blue bonds and sukuk initiatives encompass the formulation of an inclusive Blue Finance Taxonomy that precisely delineates qualifying activities and assets. Equally important are capacity development and specialized technical support to empower stakeholders with the requisite expertise and competencies for efficient project formulation and capital mobilization. The implementation of uniform Blue Certification standards is crucial to uphold transparency, integrity, and responsibility in the validation and monitoring of blue finance endeavors. Additionally, strengthening corporate readiness by systematically identifying and preparing investable projects ensures a consistent pipeline of viable

financing opportunities. Finally, the provision of incentives—whether through fiscal policies or regulatory frameworks—plays a pivotal role in encouraging issuers, thereby fostering broader market engagement and expediting the expansion of the blue finance sector.

4.2.4 Public private partnership based

A public-private partnership (PPP) is a collaborative arrangement between the government and the private sector aimed at delivering public services or infrastructure projects by leveraging the strengths of both entities (Government Regulation No. 38 of the Republic of Indonesia Year 2015, Article 1, Paragraph 6). Public-Private Partnerships (PPPs) leverage private sector resources to bridge infrastructure financing gaps, improve service efficiency, and foster innovation.

These arrangements ensure fair risk-sharing while allowing governments to tap into private expertise and funding and enabling private partners to access investment opportunities and long-term revenue. Table 4.5 provides a detailed breakdown of instruments under the Public-Private Partnership (PPP) mechanism in Indonesia.

Public-private partnerships (PPP) have become increasingly essential in addressing complex, large-scale challenges that neither the public nor private sector can solve alone—such as infrastructure development, climate resilience, and sustainable urbanization.

PPP harnesses the strengths of both sectors, combining public oversight with private sector efficiency to deliver innovative solutions to pressing societal issues. As governments face fiscal constraints and growing demands for services, PPPs play a vital role in mobilizing the resources, expertise, and innovation needed to achieve sustainable development goals. Table 4.5 provides a detailed breakdown of instruments under the Public-private partnership (PPP) mechanism in Indonesia.

Table 4.5 Instruments of the public-private partnership mechanism

Code	Instrument name	Description	Supporting regulation	Object focus	Scope
4-A	Build Operate Transfer (BOT)	Private partner signs a contract with the government to build and operate an infrastructure project for a specified period of time and transfers ownership of the project to the government at the end of period	- UU No. 19/2016 - UU No. 19/2015	Ss, Bd, CR	Meso
4-B	Build Own Operate Transfer (BOOT)	Partnership between the government and private sector where the private sector builds, owns, operates, and after a certain period of time, transfers the	UU No. 38/2015	Ls, Bd	Meso

		infrastructure project to the government			
4-C	Build Own Operate	A contractual arrangement in which the promoter finances, designs, builds, operates, and owns a facility over a specified period without the obligation to transfer ownership to the principal	• PP No 42/2021 • Permen PUPR No 23/2021 • Perpres No 66/2024 • Permen ESDM No 4/2020	Ls	Meso
4-D	Concession	A contractual arrangement in which a public authority grants a private entity, known as the concessionaire, the right to finance, construct, operate, and maintain a public infrastructure project or service for a predetermined period	• Permen Perhubungan No 48/2021 • Permen Perhubungan No 50/2021 • Permen Perhubungan No 5/2022 • PP No 31/2021	Ss	Meso

(4-A) Build Operate Transfer (BOT)

Build-Operate-Transfer (BOT) is a mechanism in which a private partner signs a contract with the government to build and operate an infrastructure project for a specified period, after which ownership of the project is transferred to the government (Regulation of the Minister of Home Affairs No. 19 of 2016). This model is particularly relevant for addressing challenges related to Ss, Bd, and CR, especially in sectors such as coastal protection, marine conservation, and climate adaptation infrastructure.

Indonesia has specific regulations governing BOT instruments, Regulation of the Minister of Home Affairs No. 19 of 2016 which procedures for cooperation between regional governments and business entities, including the use of BOT schemes in public infrastructure development. Regulation of the Head of the Public Procurement Policy Agency (LKPP) No. 19 of 2015 which guidelines for the procurement process and contract management in BOT projects.

The pilot evidence in Indonesia includes:

- Sarulla Geothermal Power Plant (North Sumatra): A global-scale geothermal project with a capacity of 330 MW, which has been fully operational since 2018. It was funded through a

mix of equity and long-term loans totaling USD 1.7 B, involving ADB, JBIC, and private investors.

- Lumut Balai Geothermal Power Plant (South Sumatra): Developed by PT Pertamina Geothermal Energy (PGE), this 110 MW plant significantly contributes to South Sumatra's renewable energy mix and reduces regional dependence on fossil fuels.
- Batang Supercritical Coal-Fired Power Plant (Central Java): A large-scale 2,000 MW project developed under a PPP scheme, serving Indonesia's growing electricity needs. It exemplifies how public-private partnerships attract major foreign investment, particularly from Japan and Indonesia.

(4-B) Build Own Operate Transfer (BOOT)

Build-Own-Operate-Transfer (BOOT) is a partnership between the government and the private sector in which the private entity builds, owns, operates, and, after a specified period, transfers the infrastructure project to the government (Presidential Regulation No. 38 of 2015)

The successful implementation of BOOT projects at the meso level depends on the stability of the regulatory environment, effective risk-sharing mechanisms between public and private stakeholders, and clear transition plans for asset transfer.

Build-Own-Operate-Transfer (BOOT) is a partnership between the government and the private sector in which the private entity builds, owns, operates, and, after a specified period, transfers the infrastructure project to the government (Presidential Regulation No. 38 of 2015) which Governs PPP schemes for infrastructure development, including the BOOT (Build-Own-Operate-Transfer) model, which allows private investment with asset transfer to the government after the operational phase ends.

Pilot evidence of BOOT implementation can be seen in the case of PT Jabar **TPPAS Nambo, managed by PT Jabar Bersih Lestari**, showcases BOOT implementation in waste management, processing up to 1,800 tons of waste daily. The project, valued at IDR 60 B, is supported by the West Java Provincial Government through Regional Capital Participation (PMD).

(4-C) Build own operate (BOO)

Build-own-operate (BOO) is a contractual arrangement in which the promoter finances, designs, builds, operates, and owns a facility over a specified period, without the obligation to transfer ownership to the principal (Ngowi et al., 2006). Unlike other models such as Build-Operate-Transfer (BOT), BOO does not require the asset to be transferred back to the government or principal entity at the end of the contract period. This means the private sector retains ownership indefinitely, allowing it to generate long-term revenue through user fees, tariffs, or government contracts. The BOO model is particularly prevalent in industries where long-term private ownership is viable and beneficial, including power generation, water treatment plants, telecommunications, and transportation infrastructure.

The Build-Own-Operate (BOO) scheme in Indonesia is governed by a comprehensive regulatory framework that facilitates its implementation, particularly in the infrastructure and energy sectors.

- Minister of Energy and Mineral Resources Regulation No. 4/2020, Endorses the BOO model for renewable energy power plants, allowing private companies to fully finance, own, and operate energy facilities without transferring ownership to the government.
- Presidential Regulation No. 66/2024 (amending Presidential Regulation No. 32/2020), Enhances legal foundations for private sector engagement in infrastructure projects.

Government Regulation No. 42/2021, Facilitates National Strategic Projects and streamlines bureaucratic processes, offering incentives for strategic infrastructure projects

Several pilot projects in Indonesia of the Build-Own-Operate (BOO) scheme:

- **Legok Nangka Waste Power Plant**, West Java: A BOO project processing 2,131 tonnes of waste per day to generate 30-50 MW of electricity. The facility was developed through a collaboration between PT PLN, Sumitomo, Hitachi Zosen, and Energia Prima Nusantara, which contributed to Indonesia's renewable energy goals.
- **Benowo Landfill Waste Power Plant, Surabaya**: This BOO project processes 1,000 tonnes of waste daily, generating 12 MW of electricity, with 9 MW sold to PT PLN. Managed by PT Sumber Organik, it uses gasification technology for energy recovery and environmental sustainability.
- **Makassar Waste Power Plant**: A BOO project with an investment of USD 200 M, processing 1,300 tonnes of waste daily to produce renewable energy. Developed in partnership with Shanghai SUS Environment and PT Sarana Utama Synergy, this project emphasizes both domestic and foreign investment in sustainable waste management solutions.

(4-D) Concession

Concession is a contractual arrangement in which a public authority grants a private entity, known as the concessionaire, the right to finance, construct, operate, and maintain a public infrastructure project or service for a predetermined period (Ng et al, 2007).

The concession period is influenced by project risk, revenue potential, and regulatory factors. Longer durations may be needed for high-risk or capital-intensive projects, but private returns must be balanced with public interest. Concessions enable infrastructure development, shift risk to the private sector, and promote collaboration for better services and economic growth.

Concessions offer several advantages within the PPP framework, particularly in facilitating infrastructure development, enhancing risk management, and fostering public-private collaboration. One of the primary benefits of concessions is their capacity to enable infrastructure development that may not be feasible through traditional public financing mechanisms. By leveraging private sector investment, concessions allow for the construction and operation of critical public infrastructure without imposing an immediate fiscal burden on the government. Additionally, concessions contribute to effective risk management by transferring significant financial, operational, and market-related risks to private entities. This risk allocation can lead to greater efficiency in project delivery and long-term sustainability. Furthermore, concessions strengthen public-private collaboration by integrating private sector expertise, innovation, and resources into the provision of public services. This synergy enhances service quality, promotes cost efficiency, and supports economic development by optimizing the use of both public and private capabilities. Regulatory Support for this instrument includes :

- Government Regulation No. 23/2021 on the Implementation of Forestry provides the legal framework for ecosystem restoration programs, including the issuance of ecosystem restoration.
- Minister of Transportation Regulation No. PM 50/2021 outlines port governance, maritime safety, and operational standards.
- Government Regulation No. 31/2021 complements the port concession framework by regulating port management and promoting investment in maritime infrastructure.

One example of pilot evidence in Indonesia for biodiversity conservation and ecosystem restoration is the Hutan Harapan project. This initiative focuses on forest restoration initiative utilizing innovative financing from bilateral donors (e.g., German IKI), philanthropic foundations (e.g., Foundation Franklinia), and private CSR funds. The project integrates biodiversity conservation, climate resilience, and community involvement, especially from the Batin Sembilan indigenous group.

4.2.5 Blended financing

Blended Financing is defined as an integrated public fund with private investments to create a more attractive risk-return profile for private investors (Mawdsley & Hughes, 2024). These financing models leverage a mix of public, private, to Philanthropic sources to support sustainable development while addressing environmental, social, and economic challenges.

These financing models leverage a mix of public, private, and Philanthropic sources to support sustainable development while addressing environmental, social, and economic challenges. The urgency of implementing a Blended Financing mechanism lies in its critical role in bridging funding gaps for achieving sustainable development goals, particularly in sectors that require long-term and large-scale investments such as agriculture, renewable energy, and climate resilience (Havemann et al, 2022).

Strategically mitigating risks, Blended Financing makes investment opportunities in emerging markets more attractive, enabling financial flows toward high-impact projects that would otherwise struggle to secure funding (Sharma et al. 2023). Traditional financial markets are insufficient to mobilize the necessary capital, making Blended Financing essential in leveraging public, donor, and Philanthropic resources to attract private investments.

Table 4.6 provides a detailed breakdown of the instruments in the Blended Financing Mechanism.

Table 4.6 Instrument of the blended mechanism

Code	Instrument name	Description	Supporting regulation	Object focus	Scope
5-A	Green Cash Waqf Linked Sukuk (CWLS)	State Sharia Securities issued with a socially responsible based investment scheme	PMK No. 23/PMK.06/2020 UU No. 41/2004	Ls	Macro, Meso
5-B	Sukuk Linked Waqf	Sharia-compliant debt securities that integrate Islamic endowment (waqf) principles with sukuk-based investment structures.	UU No. 41 of 2004 POJK No. 10/POJK.05/2017 Fatwa DSN-MUI No. 106/DSN-MUI/X/2016	Ls, Ss, Bd, and CR	Macro, Meso, Micro
5-C	Grant Loan Financing	a blended financial instrument that combines non-repayable grants with concessional loans to support projects that are both socially impactful and commercially viable.	RPJMN 2020–2024	Ls, Ss, Bd, and CR	Macro, Meso, Micro

However, despite its potential, implementing Blended Financing faces significant challenges. Transparency and accountability issues remain a concern, particularly in ensuring that funds are directed toward projects that generate real financial and developmental additionality.

The uneven distribution of risk and reward between public and private stakeholders can also create misaligned incentives, potentially reducing the effectiveness of Blended Financing interventions. Additionally, institutional barriers such as the lack of dedicated coordinating agencies, stringent reporting standards, and comprehensive monitoring frameworks can hinder effective implementation (Murray & Spronk, 2019).

(5-A) Green cash waqf linked sukuk (CWLS)

Green cash waqf linked sukuk (CWLS) is an innovative financing instrument that combines the concept of cash waqf with sharia-based investment in the form of sukuk. This instrument is designed to support sustainability-oriented projects, such as environmentally friendly transportation, waste management, and strengthening climate resilience. With sharia principles, CWLS not only provides financial benefits to investors through principal returns but also provides significant social and environmental impacts through investment returns allocated for social purposes. CWLS focuses on landscapes (LS) only and is implemented on a Macro scale.

One of the pilot evidences is the issuance of Green CWLS by the Indonesian government which is used to fund sustainable transportation projects, waste management, and other climate resilience programs. Regulations that support the implementation of this instrument include the Regulation of the Minister of Finance (PMK) Number 23/PMK.06/2020 concerning Cash Waqf in State Sukuk, which regulates the management of cash waqf in sukuk instruments for social purposes, as well as Law Number 41 of 2004 concerning Waqf.

Currently, Green CWLS is still a proposal and there is no specific pilot evidence. However, the concept of Green CWLS shows that this instrument can support sustainable financing of environmental projects by utilizing transparently managed endowed funds including waqf. This mechanism ensures the return of principal to investors, while the proceeds from fund management are used to support social and environmental programs. The potential for development is very large, especially if it involves more community participation and waqf institutions on a national scale.

(5-B) Sukuk linked waqf

Sukuk Linked Waqf (5-B) refers to Sharia-compliant debt securities that integrate Islamic endowment (waqf) principles with sukuk-based investment structures. The instrument mobilizes funds through cash waqf contributed by individuals or institutions, which are then invested in sovereign sukuk (Surat Berharga Syariah Negara/SBSN). The returns generated from these Sukuk investments are subsequently allocated by nazir (waqf managers) to finance social, educational, environmental, and economic empowerment programs.

Within the landscape of sustainable finance, Sukuk Linked Waqf contributes to achieving goals across environmental and climate resilience domains by supporting interventions in landscape rehabilitation (such as agriculture and water access), coastal ecosystem management, biodiversity conservation, and strengthening community resilience against climate risks. The implementation scope of Sukuk Linked Waqf spans macro, meso, and micro levels.

The regulatory framework governing Sukuk Linked Waqf in Indonesia includes:

- UU No. 41 of 2004 on Waqf Provides the legal foundation for the management and utilization of waqf in Indonesia.
- Minister of Finance Regulation (PMK) No. 4/PMK.05/2020 Regulates the issuance of sukuk by the Ministry of Finance.
- OJK Regulation (POJK) No. 10/POJK.05/2017 on Islamic Financial Institutions Receiving Cash Waqf (LKS-PWU) Governs the operational provisions for institutions that receive and manage cash waqf.
- Fatwa DSN-MUI No. 106/DSN-MUI/X/2016 Permits the use of waqf funds in productive investment vehicles in accordance with Islamic financial principles.

A notable pilot of Sukuk Linked Waqf in Indonesia is the issuance of Sukuk Wakaf Ritel (SWR005) in 2024, which offered a 6.5% annual return with a two-year tenor and a low entry point of IDR 1 million, enabling broad retail participation. Proceeds were allocated to productive waqf programs managed by certified nazhir under the supervision of the Indonesian Waqf Board (BWI), targeting

food security through livestock-based agriculture and providing scholarships for underprivileged students in rural and Islamic boarding schools. This initiative demonstrated the viability of integrating Islamic philanthropic capital with sovereign sukuk mechanisms to address socio-economic challenges, particularly in education, food systems, and community resilience, while expanding access to ethical and inclusive financial instruments aligned with the Sustainable Development Goals.

Sukuk Linked Waqf presents a number of strategic advantages. By combining the objectives of faith-based philanthropy with those of sustainable investment, it provides a mechanism for inclusive economic participation, especially in majority-Muslim contexts. It also fosters greater alignment between religious values and environmental-social outcomes, attracting both philanthropic and development-minded stakeholders. Furthermore, its relatively low entry point (starting from small-denomination of wakif contributions) enables broader community engagement, thereby expanding the base of investors supporting national development.

Nonetheless, this instrument faces several limitations. Public awareness and understanding of productive waqf remain low, particularly outside of Islamic finance institutions. Additionally, there is a capacity gap among many nazhir institutions in terms of project management, reporting, and fund utilization. The instrument's non-tradable nature also reduces liquidity, making it less appealing for short-term investors. Lastly, its scale and impact are dependent on continuous public participation and multi-stakeholder coordination, both of which require robust outreach and institutional commitment.

(5-C) Grant loan financing

Grant-Loan Financing (5-B) is an instrument that combines non-repayable grant funding with concessional loans to support the implementation of socially impactful yet commercially viable projects. This structure is designed to reduce financial risks and enhance project bankability, particularly in sectors that are critical to climate resilience, biodiversity conservation, and sustainable resource management. By integrating public or philanthropic grants with soft loans—often through development finance institutions—this instrument enables investment in initiatives that may not otherwise attract sufficient private capital due to their perceived high risk or long-term return horizon. Grant-Loan Financing is particularly effective in supporting projects across landscapes (e.g., reforestation, sustainable agriculture), seascapes (e.g., mangrove rehabilitation, aquaculture), biodiversity (e.g., habitat restoration), and climate resilience (e.g., climate-smart infrastructure and water resource management).

The scope of Grant-Loan Financing spans macro, meso, and micro levels. While not governed by a single regulation in Indonesia, this financing model is supported through broader national frameworks such as:

- RPJMN 2020–2024 Indonesia's medium-term national development plan that promotes innovative financing, including blended finance, to support sustainable development goals.
- Low Carbon Development Indonesia (LCDI) A national initiative led by Bappenas that integrates economic growth with emission reduction and low-carbon development strategies.
- UNFCCC and Paris Agreement Indonesia's international commitments to reduce emissions and encourage climate finance through blended approaches.
- Regulations from the Ministry of Finance, Bappenas, and OJK Enabling rules that support public-private partnerships, concessional finance mechanisms, and multilateral cooperation in development financing.

A key pilot initiative demonstrating this mechanism is the Dutch Fund for Climate and Development (DFCD). DFCD supports climate adaptation and mitigation projects in Indonesia. By providing finance

access to promising early-stage initiatives, DFCD helps companies in these sectors grow into scalable projects that are resilient to climate change.

Funded by the Dutch government, DFCD is managed by a consortium of expert organizations, including FMO, Climate Fund Managers, SNV, and WWF Netherlands. Through its Origination Facility, DFCD de-risks projects, building their capacity for financial growth and investment. This support enables companies in Indonesia's forestry, agriculture, and water sectors to develop sustainable and climate-resilient solutions.

Some of the Key Benefits are:

- 1) De-risks early-stage projects: Reduces financial risks to attract initial investors.
- 2) Boosts investment-readiness: Prepares projects for scalable and sustainable funding.
- 3) Collaboration: Engages public, private, and philanthropic actors.
- 4) Supports innovation scaling: Helps transition from pilot phase to commercial stage.

4.2.6 Donor and philanthropic financing

Donor and Philanthropic Financing Mechanism is a financial strategy aimed at fostering social and economic development by utilizing Donor and Philanthropic concepts and ideals (Williams, 2023). This mechanism entails the solicitation of voluntary or Donor and Philanthropic financial donations from individuals, organizations, foundations, or institutions, which are then distributed to projects that provide significant social benefits.

In contrast to traditional financial approaches that focus on profit-driven investments, philanthropy emphasizes social benefit, community empowerment, and sustainable development (Price et al., 2024; Hehenberger et al., 2017). Donor and Philanthropy manifests in several forms, such as grants, gifts, endowments, crowdsourcing, and impact philanthropy, often channeled through nonprofit organizations, social entrepreneurs, or government-supported programs.

In this report, Donor and Philanthropic Financing instruments are limited to those utilizing charitable funds to support social and environmental goals. At least six instruments have been implemented to support this goal in Indonesia.

The urgency of developing Donor and Philanthropic Financing is increasing in line with the growing complexity of global challenges, such as poverty, economic inequality, and environmental degradation. In many countries, including Indonesia, this mechanism offers sustainable and inclusive alternative financing that can complement the role of conventional financing.

The potential is vast, especially in supporting projects that may be of little interest to commercial investors but are critical for social and environmental sustainability. Furthermore, Indonesia, as a country with the highest giving index in the world. The Charity Aid Foundation (CAF) has once again unveiled its annual World Giving Index 2024 and Indonesia has reclaimed its position as the world's most generous country for the seventh consecutive year. In addition, as a country with a majority Muslim population, Indonesia possesses a wide array of Islamic social instruments that can further enhance the effectiveness of Donor and Philanthropic financing.

Table 4.7 below summarizes important information related to instruments in the Donor and Philanthropic Financing mechanism.

Table 4.7 Instruments of the donor and philanthropic mechanism

Code	Instrument name	Description	Supporting regulation	Object focus	Scope
6-A	Environmental Grants	International Donor for funding for various environmental projects	• UU RI No. 32/2009 • PP No. 77/2018	Ls, Ss, CR	Meso
6-B	Environmental Social Fund	Funds from the community that are directed to social and environmental programs	• UU No. 23/2011 • PP No. 98/2021	Ls	Meso
6-C	Conservation Endowment	Forest conservation by designating as non-transferable assets	• UU No 41/2004	Ls, Ss, CR	Meso
6-D	Sustainable Biodiversity through Islamic Social Funding	Utilization of Islamic social funds such as zakat to support biodiversity conservation, strengthen community livelihoods, and meet SDGs targets	• UU No. 23/2011 • UU No. 14/2014	Ls, Ss, Bd	Meso
6-E	Corporate Social Responsibility	Funds from the Company to fulfill its responsibilities and are allocated for social- environmental projects.	• UU No. 40/2007 • PP No. 47/2012	Ls, Ss, Bd, CR	Meso, Micro
6-F	Climate Change Trust Fund (CCTF)	Financing designed to ensure the sustainability of conservation and climate resilience funding.	• PP No. 80 of 2011 • PP No. 77 of 2018	Ls, Ss, CR	Meso, Micro
6-G	Result Based Financing	Instrument that disburses funds only after pre-agreed outcomes have been achieved and verified.	• UU No. 32 of 2009	Ls, Ss, CR	Macro, Meso

6-H	Pooling Fund for Disaster	Instrument that designed to protect state assets and essential government functions during disasters	● Perpres No. 75 of 2021 ● PP No. 28 of 2021	Ls, Ss, CR	Macro
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The Charity Aid Foundation (CAF) has once again unveiled its annual World Giving Index 2024 and Indonesia has reclaimed its position as the world's most generous country for the seventh consecutive year. In addition, as a country with a majority Muslim population, Indonesia possesses a wide array of Islamic social instruments that can further enhance the effectiveness of Donor and Philanthropic financing.

(6-A) Environmental grants

Environmental Grants are a form of Donor and Philanthropic financing provided by international donors, non-governmental organizations (NGOs), or the private sector to support various environmental projects. These grants are typically non-refundable funds aimed at addressing specific environmental challenges, such as biodiversity conservation, landscape restoration, and enhancing climate resilience. In Indonesia, environmental grants play a crucial role in funding initiatives that require substantial resources but are often inaccessible to local communities or organizations with limited capacity.

Regulatory Support includes:

- UU No. 32 of 2009 on Environmental Protection and Management
- Presidential Regulation No. 77 of 2018 on the Management of Environmental Funds

This instrument's primary focus includes landscapes (LS), seascapes (SS), and climate resilience (CR), typically applied at the meso scale. For example, the Global Environment Facility (GEF) Small Grants Programme (SGP) has funded over 40 local and non-governmental organizations in Indonesia for environmental projects such as mangrove ecosystem restoration and community-based forest management.

The pilot evidence in Indonesia is the GEF Small Grants Programme (GEF SGP) – Indonesia. This program provides small grants (USD 2,000–50,000) to over 40 NGOs and local communities in Indonesia, supporting grassroots conservation and climate resilience projects that directly benefit local ecosystems and biodiversity.

The potential for further development of environmental grants in Indonesia includes expanding support to more organizations and improving access through collaborations with the government and private sector. However, challenges remain, such as reliance on foreign donors for funding and difficulties in sustaining projects once the funding ends. Despite these challenges, the main advantage of this instrument is its ability to finance high-risk projects that typically do not attract commercial funding.

Indonesia's vast marine ecosystems face mounting pressures from climate change, habitat degradation, and overexploitation of resources. These challenges threaten both biodiversity and the livelihoods of millions dependent on coastal fisheries and marine industries. To address the financing gap in marine conservation, Lautra has secured an additional USD 10 million grant from the Government of Canada, channeled through the Indonesia Oceans Multi-Donor Trust Fund (MDTF) and the Problue Multi-Donor Trust Fund. This grant serves as a proof of concept for the Environmental Grant model, showcasing how international financial support can build local capacity, enhance conservation financing, and create sustainable economic pathways for coastal communities.

Key Challenges including :

1. Donor Dependency: High reliance on foreign donors for funding continuity.
2. Sustainability Risks: Many projects struggle to continue once funding ends.
3. Limited Commercial Appeal: Projects are often too risky to attract private or commercial investment.

While its Strategic Advantages Support includes :

1. High-Risk Projects: Grants fund initiatives that are too risky for commercial capital.
2. Enable Innovation: Provide a testing ground for new conservation models.
3. Empower Local Actors: Strengthen grassroots leadership and community-based conservation

(6-B) Environmental social fund

Environmental Social Fund is a Donor and Philanthropic financing mechanism that relies on community-based funds, which are allocated to social and environmental programs. This instrument leverages voluntary contributions from the community to support sustainable development, particularly in the environmental sector.

The approach aims to empower communities to address local challenges, such as providing access to renewable energy or implementing climate change mitigation measures, often in collaboration with non-governmental organizations (NGOs) and international institutions. The focus of the Environmental Social Fund is on landscape ecosystems (LS), applied at the meso scale.

One example is a program supported by the UNDP and BAZNAS, which involves constructing micro-hydro power plants in remote areas of Jambi. This program not only provides renewable energy to the community but also reduces reliance on fossil fuels. In Indonesia, key regulations supporting the management of this social fund include Law Number 23 of 2011 on Zakat Management and Presidential Regulation Number 98 of 2021 on the Economic Value of Carbon.

Evidence from pilot projects indicates that this project demonstrates how the Environmental Social Fund—by combining zakat or waqf contributions from local communities with technical support from international organizations—can effectively finance renewable energy initiatives in rural areas. It adopts a charity-to-investment approach to transform donations into sustainable investments.

However, challenges remain, includes:

1. Low Public Awareness: Limited understanding of the importance of contributing to social funds for environmental causes.
2. Coordination Gaps: Weak management and coordination at the local level.

Despite these challenges, the Strategic Advantages includes:

1. Clean Energy Access: Expands access to renewable energy in underserved areas.
2. Community Empowerment: Strengthens local participation and ownership.
3. Environmental Impact: Reduces ecological harm through an integrated, community-based approach

(6-C) Conservation endowment

Conservation Endowment is a financing mechanism that utilizes fixed assets, such as land or forests, designated for long-term environmental conservation. These assets are made non-transferable or non-sellable, ensuring their sustainability in supporting ecosystem protection. The aim of this instrument is to create a lasting, positive environmental impact while empowering local communities to manage their natural resources responsibly. There are currently no specific regulations governing endowment funds for environmental conservation in Indonesia.

The focus of the Conservation Endowment encompasses landscape (LS), seascape (SS), and climate resilience (CR), applied at the meso scale. One example is the Bogor Waqf Forest, which is protected due to the area's vulnerability to landslides. This initiative not only seeks to conserve the forest but also empowers local communities by providing training and responsible access to natural resources. There are currently no specific regulations governing endowment funds for environmental conservation in Indonesia.

Pilot evidence from the Bogor Waqf Forest shows that the Conservation Endowment can be an effective model for preventing environmental degradation and strengthening community-based resource management. This model involves collaborative forest management between waqf management organizations, local communities, and local governments.

Expanding Conservation Endowments can protect more vulnerable areas in Indonesia, but it faces challenges like low public awareness and limited management capacity. Still, it offers lasting ecosystem benefits and community empowerment.

(6-D) Sustainable biodiversity through islamic social funding

Sustainable Biodiversity through Islamic Social Funding is an innovative financing mechanism that utilizes Islamic social funds—such as zakat, infaq, and sedekah—to support biodiversity conservation. These funds are directed towards enhancing community resilience, supporting environmental programs, and achieving the Sustainable Development Goals (SDGs). This mechanism integrates sharia principles with a community-based approach to address environmental challenges, particularly focusing on biodiversity sustainability in landscapes and seascapes.

Relevant regulations include :

- Law Number 23 of 2011 concerning Zakat Management
- Government Regulation Number 14 of 2014 concerning the Implementation of the Zakat Law, which provide a legal framework for the professional and transparent management of zakat.

This instrument specifically targets landscapes (LS), seascapes (SS), and biodiversity (BD), applied at the meso scale. An example of its application is the BAZNAS-UNDP BIOFIN program, which seeks to promote community resilience and biodiversity sustainability. This program uses a community-based approach to enhance the efficiency and effectiveness of Islamic social funds.

Pilot evidence from the BAZNAS-UNDP BIOFIN program demonstrates success in empowering local communities to engage in biodiversity conservation efforts. The program has funded initiatives such as environmental rehabilitation and the strengthening of community-based economies. This financing mechanism has significant potential for national expansion, especially through synergies between zakat management institutions and international organizations.

Challenges of this instrument includes:

1. Difficulty in coordinating complex multi-stakeholder activities
2. Limited capacity in consistent and transparent reporting
3. Sustainability concerns after project funding ends.

While its opportunities includes:

1. High financial potential from Islamic social funds (e.g., zakat, infaq, waqf)
2. Strong community-based approach in conservation
3. Encourages active local participation in managing natural resources.

Main advantages:

1. Sustainable, flexible, and results-based financing
2. Ability to build endowment capital for periodic disbursement
3. Long-term funding without depleting the principal fund

The Cali Fund, established at COP-16 of the Convention on Biological Diversity, aims to ensure benefit-sharing from the use of digital sequence information (DSI) derived from biodiversity. Industries are encouraged to contribute 1% of profits or 0.1% of revenues from DSI use, with a funding target of USD 200 B annually by 2030. Half of the fund is allocated to local communities for forest conservation, ecosystem restoration, and sustainable development. This aligns with Indonesia's RPJPN 2025–2045, which positions bioeconomy as a strategic development pillar, leveraging the country's rich biodiversity for sustainable innovation.

(6-E) Corporate social responsibility (CSR)

Corporate Social Responsibility (CSR) is a Donor and Philanthropic mechanism that involves companies in funding and implementing social and environmental programs as a form of responsibility to the community and the environment.

Through CSR, companies not only focus on business profits but also contribute to the sustainability of the ecosystem through various initiatives such as environmental restoration, biodiversity conservation, and strengthening community resilience to climate change. CSR is usually realized in the form of partnership programs or direct funding for activities relevant to environmental issues.

Regulations that support the implementation of CSR include:

- Law Number 40 of 2007 concerning Limited Liability Companies, especially Article 74 which regulates CSR obligations for certain companies.
- Government Regulation Number 47 of 2012 concerning Social and Environmental Responsibility of Limited Liability Companies.

This instrument focuses on landscapes (Ls) and Seascapes (Ss), and is applied at the Meso and Micro scales. One example of CSR implementation in Indonesia is PT Pertamina's program in restoring mangrove ecosystems and PT Astra Agro Lestari's program which supports forest conservation and biodiversity protection in the western region of Indonesia.

An example of CSR success can be seen from the PT BNI Marine Ecosystem CSR Program which is a corporate social responsibility initiative by PT BNI that focuses on preserving marine ecosystems to support biodiversity and climate resilience. The program involves collaboration with local communities and NGOs, and demonstrates how CSR funds can be used to drive environmental sustainability while enhancing corporate reputation.

(6-F) Conservation/climate change trust fund (CCTF)

Conservation/climate change trust fund (CCTF) is a form of donor and Philanthropic and long-term grant-based financing designed to ensure the sustainability of conservation and climate resilience funding. This fund comes from international donors, multilateral institutions, Donor and Philanthropic organizations, and the private sector that do not expect financial reciprocity.

The Trust Fund essentially acts as a structured and accountable funding distribution mechanism, with the main objective of supporting biodiversity conservation efforts, sustainable landscape and seascape management, and strengthening resilience to climate change.

Key regulations underlying the establishment and operation of this trust fund include:

- Presidential Regulation No. 80 of 2011 on the Establishment of the ICCTF
- Presidential Regulation No. 77 of 2018 on the Management of Environmental Funds which provide a legal basis for the management of environmental funds based on results and transparency.

This instrument focuses on three main thematic areas: landscape (LS), seascape (SS), and climate resilience (CR), which are generally applied at meso to national scales. For example, the Indonesia Climate Change Trust Fund (ICCTF) has been operating since 2009 as a national funding mechanism to support strategic climate change programs, with grants distributed to ministries, research institutions, and local NGOs. The thematic focus of the ICCTF includes climate change mitigation and adaptation, as well as strengthening national capacity in managing climate change funds.

One real example of the implementation of Trust Funds in the marine conservation sector is the support for the Laut untuk Kesejahteraan (Lautra), a national pilot trust fund initiative supported by the World Bank and the Government of Canada through the MDTF and Problue Trust Fund. With a USD 10 million grant and a total commitment of USD 210 million, Lautra finances community-based marine conservation projects, ecosystem-based adaptation, and blue economy integration in coastal areas.

The potential for developing Trust Funds in Indonesia is enormous:

1. Bridge long-term conservation funding gaps
2. Expand geographic and sectoral reach
3. Engage private sector participation

However, challenges remain, such as:

1. Complex multi-donor governance structures
2. Limited local capacity for proposal development
3. Lack of credible monitoring and evaluation systems.

The main advantage of the Conservation & Climate Change Trust Fund is :

1. Sustainable, flexible, and results-based financing
2. Ability to build endowment capital for periodic disbursement
3. Long-term funding without depleting the principal fund

The Cali Fund, established at COP-16 of the Convention on Biological Diversity, aims to ensure benefit-sharing from the use of digital sequence information (DSI) derived from biodiversity. Industries are encouraged to contribute 1% of profits or 0.1% of revenues from DSI use, with a funding target of USD 200 B annually by 2030. Half of the fund is allocated to local communities for forest conservation, ecosystem restoration, and sustainable development. This aligns with Indonesia's RPJPN 2025–2045, which positions bioeconomy as a strategic development pillar, leveraging the country's rich biodiversity for sustainable innovation.

(6-G) Result based financing

Result-Based Financing (RBF) is an innovative financing instrument introduced by multilateral development institutions such as the World Bank to enhance the effectiveness and accountability of

development spending, including in the environmental sector. RBF operates on the principle that funds are disbursed only after pre-agreed results have been achieved and verified. This approach shifts the focus from inputs and activities to tangible outcomes, such as improved biodiversity, enhanced climate resilience, or restored ecosystems.

RBF in Indonesia is not governed by a single regulation but is integrated into broader frameworks like UU No. 32 of 2009 on Environmental Protection and performance-based budgeting. Technical procedures are usually outlined in donor agreements and project documents.

In the context of environmental protection in Indonesia, RBF provides a mechanism to finance projects related to landscapes (LS), seascapes (SS), and climate resilience (CR) by ensuring that recipients are rewarded for performance, not just for effort. The instrument is particularly suited for meso-scale interventions where measurable environmental outcomes can be defined, monitored, and verified.

One notable application of RBF in Indonesia is Indonesia Sustainable Landscapes Management Program (SLMP). This program utilizes the World Bank's Program-for-Results (PforR) mechanism with performance-based components to reduce deforestation and promote sustainable land use. Though not directly targeting biodiversity, it demonstrates the growing potential of Results-Based Financing (RBF) in environmental programs.

Results-Based Financing (RBF) incentivizes efficiency, innovation, and measurable impact, making it appealing to both donors and governments. It encourages focus on outcomes like biodiversity conservation and climate resilience.

However, effective implementation requires strong M&E systems, reliable baseline data, and clear indicators—often lacking at the community level. With proper safeguards and capacity building, RBF holds strong potential to scale as a key instrument aligning donor support with Indonesia's environmental priorities.

(6-H) Pooling fund for disaster

The Pooling Fund for Disaster, established under Presidential Regulation No. 75 of 2021, represents an innovative blended financing mechanism within Indonesia's disaster risk financing framework. It combines multiple funding sources—including annual disaster reserve allocations, national and regional government budgets, and private sector contributions—to provide structured, sustainable support for both disaster preparedness (pre-disaster) and recovery (post-disaster) phases.

The Pooling Fund for Disaster thus functions as a cornerstone of Indonesia's blended disaster financing strategy, bridging funding gaps between emergency response and long-term resilience. Its advantages include reduced reliance on external aid, financial predictability, and strategic alignment with national planning.

2 examples of Disaster Financing Instruments in Indonesia:

1) Pooling Fund

- Function: Post-disaster protection of state assets and public services.
- Regulation: Government Regulation No. 28 of 2021 on the Industrial Sector.
- Focus: Critical infrastructure, including industrial zones.
- Goal: Ensure government continuity and support landscape & climate resilience.

2) Ready-to-Use Fund (Dana Siap Pakai / DSP)

- Function: Pre-disaster and emergency rapid response funding.
- Regulations: Government Regulation No. 22 of 2008 & BNPB Regulation No. 4 of 2020.

- Funding Sources: National and regional budgets (APBN/APBD) and community contributions.
- Use Case: Emergency deployment for floods and landslides in Mempawah & Purworejo (2025).

The pilot evidence in Indonesia includes Multi Donor Fund for Aceh & Nias (2005–2012) which mobilized USD 692 M for post-tsunami recovery, showcasing the effectiveness of pooled funding for long-term disaster reconstruction and Kitabisa.com Crowdfunding Platform which demonstrates the potential of community-based blended finance to support rapid, localized disaster recovery efforts in Indonesia.

5. Development strategy

5.1 General issues and development strategy

After analyzing the various challenges faced in implementing innovative financing instruments in Indonesia, we have grouped these issues into four key clusters: Technology Transformation, Stakeholder Collaboration, Funding Access, and Awareness and Regulation.

These challenges involve technical aspects and require effective cross-institutional coordination, increased public literacy, and enhanced local capacity to support green financing. To address these challenges, it is crucial to analyze the most feasible solutions and the role of stakeholders in ensuring the successful resolution of these issues.

Table 5.1 Overview of general issue

Cluster 1	Cluster 2	Cluster 3	Cluster 4
Data, Infrastructure and Technology Transformation	Stakeholder Collaboration	Funding Access	Awareness and Regulation
GI-1 Lack of Technology and Data to Support Evidence-Based Decision Making in Innovative Financing GI-2 Inadequate Infrastructure for Monitoring and Reporting	GI-3 Lack of Private Engagement in Green Finance and Sustainable Projects GI-4 Low Level Capacity of Local Institutions to Manage and Supervise Sustainability Projects GI-5 Inter-Agency Coordination Constraints in Green and Social Project Management	GI-6 High Costs of Capital (due to high cost of labeling) GI-7 Limited Access to Funding for Community-Based Initiatives and Eco-Friendly Projects GI-8 Foster Multi Stakeholder Collaboration to Drive Research and Innovation in Green Technology GI-9	GI-11 Lack of Public and Business Literacy on Sustainable Financing Mechanisms GI-12 Inconsistent Regulations and Standards for Implementation and Reporting GI-13 Lack of Awareness to Contribute to Environmental and Social Funding GI-14

		Dependence on Foreign Donors for Long-Term Project Financing GI-10 Limited Incentives for Private Sectors to Support Sustainability Projects	Lack of Awareness of the Economic Benefits of Sustainable Finance in Private Sector GI-15 Perceptions of High Risk in Sustainable Projects, which reduce Investor Participation
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Following the identification of general issues, the subsequent step involved clustering, as detailed below.

5.1.1 Cluster 1 - data, infrastructure and technology transformation

This cluster includes two General Issues (GI) and two Development Strategies (DS) that highlight the importance of technology, infrastructure, and data in supporting innovative financing for environmental sustainability.

GI-1: Lack of technology and data to support evidence-based decision making for developing innovative financing

The main problem in innovative financing is the lack of adequate technology and data to support evidence-based decision-making. Without standardized and easily accessible data, stakeholders have difficulty assessing the risks, effectiveness, and impacts of green and sustainable financing.

DS-1: Establish a national integrated data platform to enhance access to sustainable finance (mid-term implementation: 1-3 years)

To address this problem, it is necessary to build a national integrated data platform to improve access to sustainable financing. The strategic steps include:

- Standardization and integration of financial and environmental data
- Encourage the private sector to provide project-specific data to increase transparency

The stakeholders involved in making this Strategy a success include:

- Ministry of Finance of the Republic of Indonesia and Financial Services Authority (OJK): Develop regulations and financial incentives for data sharing
- Bank Indonesia and BPS: Standardize and integrate financial and environmental data.
- BAPPENAS: Standardize and integrate financial and environmental data.
- Private Sector: Provide project-specific data to enhance transparency.

GI-2: Inadequate infrastructure for monitoring and reporting

Lack of adequate infrastructure for monitoring and reporting is a major challenge in ensuring the effectiveness of sustainable finance policies and programs. Existing monitoring systems are fragmented and underutilize advanced technologies such as blockchain or satellite-based monitoring.

DS-2: Strengthen digital infrastructure and satellite-based monitoring to improve environmental oversight (mid-term implementation: 1-3 years)

The main solution needed is to strengthen digital infrastructure and adopt satellite technology to improve environmental oversight. The strategic steps include:

- Develop satellite-based monitoring methods to improve the accuracy of environmental data
- Provide financial support for technological transformation in monitoring and reporting
- Adopting digital reporting standards

The relevant stakeholders to make this Strategy a success include:

- Financial Services Authority (OJK): Implement regulations and supervise sustainability reporting
- Related Ministries/Institutions & Private Sector: Fund and develop digital technology and satellite-based monitoring systems

Conclusion of cluster 1

This cluster focuses on the main challenges related to the lack of technology and data as well as adequate monitoring infrastructure to support innovative financing in Indonesia. Therefore, the main strategies that need to be carried out include building an integrated data platform, utilizing satellite and blockchain technology, and improving digital reporting standards. With proper implementation, these steps will improve the transparency, accountability, and effectiveness of sustainable financing policies in Indonesia.

5.1.2 Cluster 2 - stakeholder collaboration

This cluster includes three General Issues (GI) and three Development Strategies (DS) that highlight the importance of stakeholder collaboration in driving innovative financing for sustainable projects.

GI-3: Lack of private engagement in green finance and sustainable projects

One of the main challenges in green finance is the lack of private sector engagement in sustainable projects. Many companies are reluctant to invest due to the lack of fiscal incentives, unclear regulations, and the lack of financing mechanisms that suit their needs.

DS-3: Design targeted fiscal incentives to attract private investment in green projects (mid-term implementation: 1-3 years)

To increase private sector involvement, specifically designed fiscal incentives are needed, including:

- Development and implementation of tax cuts, grants, and Blended Financing schemes
- Alignment with Islamic finance mechanisms to attract more investors
- Facilitating regulatory approval for green finance instruments
- Increasing private sector participation in green projects
- The relevant stakeholders to make this Strategy a success include:
 - Ministry of Finance: Develop & implement tax deductions, grants, and Blended Financing schemes
 - Financial Services Authority (OJK): Facilitate regulatory approval for green finance instrument
 - National Committee for Sharia Economics and Finance (KNEKS): Ensuring alignment of green finance schemes with sharia principles

GI-4: Low level capacity of local institutions to manage and supervise sustainability projects

Many institutions at the local level have low capacity to manage and supervise sustainable projects. These limitations include lack of training, funding mechanisms, and weak coordination between local and national institutions.

DS-4: Implement a technical assistance and capacity-building program for local authorities (mid-term implementation: 1-3 years)

- To overcome these limitations, a technical assistance and capacity-building program is needed for local governments, which includes:
- Development of national training modules and funding mechanisms
- Establishment of green finance task forces at the local level by local governments
- Provision of technical training by universities and NGOs

The relevant stakeholders to make this Strategy a success include:

- Bappenas and Ministry of Finance: Provide training modules and funding mechanisms
- BPD LH : Facilitate fund disbursement for capacity-building
- Local Governments: Establish green finance task forces at the local level
- Universities and NGOs: Provide technical training for stakeholders at the local level

GI-5: Inter-agency coordination constraints in green and social project management

Inter-agency coordination is a challenge in the implementation of green and social finance. Many overlapping policies and the lack of harmonization between environmental regulations and financial instruments hamper the implementation of sustainable projects.

DS-5: Establish a cross-agency task force to coordinate and accelerate the implementation of sustainable finance initiatives (mid to long-term implementation: 1 to >3 year)

To improve coordination between institutions, a cross-agency task force is needed to:

- Lead the formation of the task force and ensure policy alignment
- Align environmental policies with financial incentives
- Standardize regulatory approaches across institutions
- The stakeholders involved in making this Strategy a success include:
- BAPPENAS : Lead task force formation and ensure policy alignment.
- KemenLHK : Align environmental policies with financial incentives.
- Coordinating Ministry for Economic Affairs (Kemenko): Facilitate high-level coordination between institutions
- Financial Services Authority (OJK): Standardize financial regulations related to sustainable projects

Conclusion of cluster 2

This cluster highlights the importance of private sector involvement, capacity building of local institutions, and better coordination between institutions in supporting innovative finance for green projects. The proposed strategies include providing fiscal incentives for the private sector, capacity building of local governments, and the establishment of a cross-agency task force to accelerate the implementation of sustainable finance. Implementation of this strategy will strengthen the role of stakeholders and encourage the growth of green investment in Indonesia.

5.1.3 Cluster 3 - funding access

This cluster includes five General Issues (GIs) and five Development Strategies (DSs) that highlight challenges in accessing finance and strategies to overcome these barriers to accelerate sustainable finance.

GI-6: High costs of capital (due to high cost of labelling)

One of the main barriers to green finance is the high cost of capital, which is exacerbated by the high cost of environmental certification and labelling processes. This hinders companies from obtaining sustainable finance.

DS-6: Introduce a subsidized guaranteed scheme to reduce issuance costs for green initiatives (short to mid-term implementation: <1 to 3 year)

To address this issue, a subsidy scheme is needed that includes:

- Establishment of a fund to subsidize certification costs
- Development of a regulatory framework for green, blue, and environmental labelling
- Provision of affordable financing for certification by financial institutions
- The stakeholders involved in making this Strategy a success include:
- Kemenkeu : Establish a fund for subsidizing certification costs
- Financial Services Authority (OJK): Create a regulatory framework for green, blue and environmental labelling
- Financial Institutions: Providing subsidized financing schemes for certification

GI-7: Limited access to funding for community-based initiatives and eco-friendly projects

Many community-based initiatives and eco-friendly projects struggle to access financing due to the lack of financial instruments that suit their needs.

DS-7: Develop micro green finance and blended financing mechanisms to expand access to capital for small-scale green initiatives (mid-term implementation: 1-3 years)

Strategies that can be implemented include:

- Development of green microfinance instruments
- Alignment with Blended Financing
- Support from Donor and Philanthropic insurance and private investors for impact-based investment
- The relevant stakeholders to make this Strategy a success include:
- Financial Services Authority (OJK): Regulation of green microfinance instruments
- Ministry of Cooperatives and SMEs: Facilitating MSME access to Blended Financing
- Private Investors & Donor and Philanthropic Institutions: Providing funds and integration of social finance

GI-8: Low research funding and investment for effective sustainability solutions

Research and innovation funding for sustainability solutions is still limited, hampering the development of green technologies that can accelerate the green economy transition.

DS-8: Foster multi-stakeholder collaboration to drive research and innovation in green technology (mid to long-term implementation: 1 to >3 years)

To improve research and innovation, it is necessary to:

- Allocate a national budget for funding sustainability-related R&D
- Research on innovative financing models that focus on environmental aspects
- Provision of low-interest funding schemes for green innovation
- The stakeholders involved in making this Strategy a success include:
- Government & Bappenas: Allocate a national budget for green R&D
- Universities & Research Institutions: Conduct research on sustainable financing models
- Financial Institutions: Provide low-interest funding schemes for green innovation

GI-9: Dependence on foreign donors for long-term project financing

Dependence on foreign donors for long-term financing of sustainability projects poses a risk to the sustainability of the program due to fluctuations in international funding commitments.

DS-9: Establish a national environmental pooling fund to mobilize domestic resources for sustainable projects (mid-term implementation: 1-3 years)

To reduce this dependency, it is necessary to establish:

- A national green investment fund that is independently managed
- Investment schemes by state-owned enterprises in green projects
- Integration of social finance such as waqf and zakat into fund contributions
- Related Stakeholders:
 - Kemenkeu: Managing the national green investment fund
 - OJK & Ministry of Finance: Regulation of environmental fund governance
 - Islamic Philanthropy & Finance Institutions: Contribution of social finance to green funds

GI-10: Limited incentives for private sectors to support sustainability projects

The lack of incentives for the private sector limits their involvement in sustainability projects, despite their large investment potential.

DS-10: Develop a system of awards, tax incentives, and non-tax benefits for sustainable businesses (short-term implementation: <1 year)

Some strategies that can be implemented include:

- Providing tax incentives for businesses that implement sustainability principles
- Rewards for companies that lead green initiatives
- Adopting sustainable finance practices as industry standards
- The stakeholders involved in making this strategy a success include:
 - Ministry of Finance & OJK: Design and implement tax incentives
 - Ministry of Industry & Bappenas: Encourage sustainable finance practices
 - Business Associations & Investors: Promote leadership in green business

Conclusion of cluster 3

This cluster highlights challenges in access to funding and offers solutions through subsidy schemes, green microfinance, innovation funding, the establishment of a national environmental fund, and incentives for the private sector. This strategy aims to accelerate the transition to a green economy by increasing the involvement of various stakeholders.

5.1.4 Cluster 4 - awareness and regulation

This cluster includes 5 General Issues (GI) and 5 Development Strategies (DS) that focus on sustainable financial literacy, regulation, and green investment risk mitigation.

GI-11: Lack of public and business literacy on sustainable financing mechanisms

The lack of literacy of the public and business actors on sustainable financing mechanisms is a major challenge. This results in low participation in sustainable finance schemes and difficulties in accessing green financing.

DS-11: Roll out a nationwide sustainable finance literacy campaign targeting government, businesses, schools, and communities

As a solution, there needs to be a national sustainable finance literacy campaign targeting various groups, including government, businesses, schools, and communities. This strategy is implemented in the short term.

The stakeholders involved in making this strategy a success include:

- Financial Services Authority (OJK) → Leading the sustainable finance literacy campaign.
- Educational Institutions → Integrating sustainable finance into the main curriculum.

GI-12: Inconsistent regulations and standards for implementation and reporting

Inconsistent regulations and standards in the implementation and reporting of sustainable finance hinder legal certainty and effective policy implementation.

DS-12: Harmonize regulations and develop a standardized green finance taxonomy to enhance policy consistency

To address this issue, it is necessary to harmonize regulations and develop a standardized green finance taxonomy. This aims to improve the consistency of sustainable finance policies in the medium and long term (Mid & Long Term). The stakeholders involved in making this Strategy a success include:

- Government/Policy Makers → Ensure policy consistency.
- Bappenas & OJK → Integrate financial sustainability into national planning.

GI-13: Lack of awareness to contribute to environmental and social funding

Public and corporate awareness in supporting environmental and social funding is still low. Many potential sources of funds such as CSR, zakat, and waqf have not been optimally utilized.

DS-13: Develop an incentive-driven CSR, zakat, and waqf framework to channel social finance into sustainability projects (short & mid term)

An incentive scheme is needed that encourages CSR, zakat, and waqf so that they can be used more effectively to support sustainability projects. The stakeholders involved in making this strategy a success include:

- Ministry of Religion and BAZNAS → Mobilize funds from zakat and waqf.
- OJK & BI → Develop a social finance incentive scheme.

GI-14: Lack of awareness of the economic benefits of sustainable finance in the private sector

The private sector still lacks understanding of the economic benefits of implementing sustainable finance, which leads to low engagement in green investment.

DS-14: Create a business case repository and best-practice models for private sector engagement in sustainable finance

To increase private sector awareness, a database of business cases and best practice models in implementing sustainable finance needs to be created. The stakeholders involved in making this strategy a success include:

- Bank Indonesia (BI) & OJK → Develop a case study repository.
- Business & Corporate Associations → Share success stories and participate in best practice forums.

GI-15: Perceptions of high risk in sustainable projects, which reduce investor participation

Many investors are reluctant to participate in sustainable projects due to the perception of high risk, especially related to the certainty of investment returns.

DS-15: Establish risk mitigation mechanisms, such as green credit guarantees and insurance schemes, to attract sustainable investment (Mid & Long Term)

To increase investor confidence, risk mitigation mechanisms such as green credit guarantees, and insurance schemes are needed. The stakeholders involved in making this strategy a success include:

- Insurance Companies → Provide risk protection mechanisms.
- Development Banks → Offer concessional financing for high-risk green projects.
- OJK & BI → Regulate green credit guarantee schemes.

Cluster 4 conclusion

Cluster 4 highlights the importance of sustainable financial literacy, regulatory harmonization, social financial incentives, and green investment risk mitigation. Some strategies must be implemented immediately (short term), while others require more time for effective implementation (medium and long term). Various stakeholders such as OJK, BI, Bappenas, Ministry of Religious Affairs, BAZNAS, Insurance, and Development Banks play a role in realizing these solutions.

5.2 National recommendation on innovative finance

The diagram below provides an overview of Indonesia’s innovative finance ecosystem, outlining key mechanisms, supporting structures, and strategic advantages of private and market-based approaches. It also highlights the alignment with national policy priorities such as the RPJMN 2020–2024. This overview serves as a foundation for the more detailed discussion in the subsequent section.



Figure 5.1 Overview of Indonesia’s Innovative Finance

5.2.1 Sustainable finance ecosystem structure

The transition to sustainable economic development in Indonesia requires the establishment of a robust and well-structured financial ecosystem that effectively integrates various stakeholders, including the private sector, public institutions, non-governmental organizations (NGOs), and local communities. A comprehensive and inclusive framework is essential to ensure that a strong foundation of collaboration and coordination among these groups supports sustainable finance initiatives. For this ecosystem to function efficiently, it must facilitate the alignment of economic growth with environmental sustainability, social equity, and long-term resilience. The private sector plays a crucial role in driving innovation, capital allocation, and the scaling of sustainable practices, while public institutions provide the necessary policy, regulatory frameworks, and incentives to support these efforts. NGOs contribute by advocating for environmental and social justice, ensuring that the voices of marginalized groups are heard, and holding stakeholders accountable.

Additionally, local communities are integral to the success of sustainable finance, as their participation and engagement are essential in ensuring that initiatives are relevant, culturally appropriate, and effective on the ground.

5.2.2 Two key innovative finance mechanisms

It is imperative that the national strategy for innovative finance prioritize two essential mechanisms: sustainable corporate financing and market-based financing. This will ensure the successful implementation of environmental initiatives across various landscapes, seascapes, biodiversity conservation efforts, and climate resilience projects.

These mechanisms serve as critical tools for mobilizing capital efficiently and targeted, aligning financial resources with the overarching goals of sustainable development.

Together, these two mechanisms play a pivotal role in directing financial flows toward projects that address critical environmental challenges, including climate change, biodiversity loss, and ecosystem degradation.

They provide the necessary financial infrastructure to support the transition to a sustainable, low-carbon economy and ensure that economic development is harmonized with environmental protection.

The success of these strategies hinges on robust policy frameworks, transparent reporting, and the active engagement of both public and private sector stakeholders. These create a resilient and effective financing structure for achieving long-term sustainability goals.

5.2.3 Advantages of private & market-based approaches

Compared to other mechanisms, such as Public-Private Partnerships (PPPs) and Government-Based Financing, these two approaches are more cost-effective for infrastructure development. They reduce bureaucratic hurdles and facilitate targeted investments that leverage private sector expertise.

Additionally, they offer greater flexibility, allowing for tailored solutions that address local socio-economic contexts and specific environmental challenges, while also engaging public support, NGOs, and local communities in the process.

5.2.4 National policy support

A robust and comprehensive regulatory framework, which plays a pivotal role in ensuring the successful implementation of these mechanisms at the national level, underpins their adoption.

This commitment is clearly demonstrated through the inclusion of these mechanisms in the National Development Plan (RPJMN 2020–2024), a strategic document that outlines the government's priorities for economic and social development.

The RPJMN serves as a testament to the government's dedication to fostering an enabling environment for sustainable finance, where policies and regulations are designed to facilitate the integration of innovative financing mechanisms into the broader national development agenda.

By incorporating Sustainable Corporate Financing and Market-Based Financing into the RPJMN, the government acknowledges the importance of these mechanisms in achieving sustainable development goals, particularly those related to landscape, seascape, climate resilience, and biodiversity.

5.3 Pilot guidelines for 3 priority area

This section aims to provide initial guidelines for program implementation in the three designated priority areas. These pilot guidelines are designed to ensure sustainability, relevance, and effectiveness of interventions while considering the unique characteristics of each area. This approach is expected to serve as a flexible and adaptive model to support the overall achievement of program objectives. The pilot guidelines for the three areas are explained as follows.

5.3.1 Central Java

Central Java, with its extensive 56,000-hectare mangrove ecosystem, plays a critical role in coastal protection and biodiversity conservation. However, the region still requires improved land and seascape management to enhance its environmental sustainability. Demographically, according to the Central Statistics Agency (BPS), Central Java’s employment structure in 2023 is dominated by three main sectors: Agriculture, Forestry, and Fisheries employing 4.3 million people; Mining and Quarrying with 3.6 million workers; and Business and Services engaging 3.1 million individuals. Central Java has demonstrated substantial economic growth, particularly in investment, which surged from IDR 18.6 billion (EUR 1.08 M) in 2019 to IDR 30.6 billion (EUR 1.77 M) in 2020 and further increased to IDR 31.31 billion (EUR 1.81 M) in 2021. Investment realization was concentrated in five key sectors: transportation and telecommunications (27.10%), the non-metallic mineral industry (14.88%), electricity, gas, and water (14.50%), housing, industrial estates, and offices (11.62%), and the food industry (5.94%). This investment expansion contributed significantly to employment, absorbing a workforce of 144,229 individuals.

The province of Central Java faces several pressing environmental challenges that threaten its ecological sustainability and economic stability. These issues include land degradation due to urbanization, deforestation that disrupts ecosystems, and water damage, which exacerbates the risks of floods and landslides. Addressing these challenges requires a strategic approach that integrates innovative financing mechanisms to foster sustainable development while mitigating environmental risks. Based on Central Java’s current conditions, the following is a mapping of its Strengths, Weaknesses, Opportunities, and Threats (SWOT), see table 5.1.

Table 5.2 SWOT of Central Java

Strengths	Weaknesses
1) Mangrove ecosystem: 56,000 ha supporting coastal protection & biodiversity. 2) Agriculture & fisheries: employs 4.3 million, core to the local economy. 3) Investment growth: up from idr 18.6b (2019) to idr 31.31b (2021). 4) Top sector: transport & telecom: 27.10% of total investment. 5) Job creation: 144,229 new jobs from sectoral investments.	1) Low forest cover: only 29% of the land is forested, most being plantation forests, threat to biodiversity. 2) Land degradation: deforestation and urbanization require improved management strategies to mitigate their harmful effects. 3) Monoculture in afforestation: increases soil erosion risks. 4) Declining water quality: decreasing water resources negatively affect to various sectors. 5) Suboptimal waste management: poor waste management exacerbates pollution and weakens ecosystem resilience.

Opportunities	Threats
1) Innovative financing: supports sustainable development and environmental risk mitigation. 2) Eco- and conservation tourism: mangrove ecosystems offer potential for nature-based tourism. 3) Sustainable infrastructure: driven by major investments in transport and telecom sectors. 4) Multi-stakeholder collaboration: involves government, farmers, private sector, and NGOs. 5) Climate action: focus on reforestation and environmental rehabilitation for resilience.	1) Hydro-meteorological risk: vulnerable to floods and landslides from deforestation and urban sprawl. 2) Resource overuse: unsustainable exploitation threatens ecosystems. 3) Unequal growth: uneven investment can widen economic disparities. 4) Climate impact: disasters and declining productivity in agriculture and fisheries. 5) Investment competition: needs to boost regional competitiveness.

To address these challenges in Central Java, this report outlines the most feasible financing mechanisms, along with their implementation strategies and the necessary steps to ensure their effectiveness, as detailed below.

Sustainable corporate financing

Central Java's longstanding dependence on monoculture plantations and inadequate waste management has contributed to land degradation, biodiversity loss, and growing hydro-meteorological risks. Despite these environmental challenges, the province remains an economic engine driven by agriculture, forestry, and fisheries—sectors where private companies play a vital role.

These dynamics make sustainable corporate financing the most suitable innovative financing mechanism for Central Java. By encouraging private sector participation in financing restoration and resilience efforts, this mechanism can integrate ESG (Environmental, Social, and Governance) criteria into corporate investments. Tools such as green or blue loans, impact investment, and sustainable supply chain finance offer targeted solutions that can align profit motives with long-term ecological sustainability.

To effectively operationalize sustainable corporate finance in Central Java, several key implementation steps are recommended. First, aligning local agribusiness and forestry companies with ESG standards is essential to ensure that business practices contribute positively to environmental and social outcomes. Second, facilitating access to green and blue loans can unlock much-needed capital for sustainable practices, particularly in land and water-based sectors. Third, incentivizing impact investment—especially for ecosystem restoration projects—can attract investors with a dual focus on financial returns and measurable environmental benefits. Finally, developing sustainable supply chain financing can help anchor corporate sustainability throughout the production and distribution networks, ensuring long-term resilience and accountability across industries. By embedding sustainability into business financing strategies, Central Java can mobilize private capital to restore degraded landscapes while sustaining economic growth.

5.3.2 Bangka Belitung Islands

Bangka Belitung Islands, characterized by their vast post-mining landscapes and emerging geotourism potential, face significant environmental challenges requiring comprehensive land and seascape restoration.

According to WALHI (2024), the region has 15.579 hectares of degraded land due to extensive mining activities, with reclamation efforts covering only 299,47 hectares by PT Timah Tbk in 2021. Bangka Belitung Islands’ economy is undergoing diversification, reducing its dependence on tin mining as other sectors, particularly tourism, contribute increasingly to regional revenue. This shift is reflected in the growth of tourism-generated income, which rose from IDR 58.2 billion (EUR 3.38 M) in 2018 to IDR 63.8 billion (EUR 3.70 M) in 2019, alongside total investments reaching IDR 4.2 billion (EUR 244 K) in 2023 and further increasing to IDR 7.6 billion (EUR 441 K) in 2024. While the mining industry remains dominant, other sectors, including the metal and food industries, are expanding. This economic transformation has positively impacted employment, absorbing a workforce of 10,717 individuals.

Bangka Belitung is currently facing severe environmental challenges, primarily due to water pollution from illegal mining, coastal degradation that threatens fisheries, and environmental risks impacting tourism. These issues demand urgent and sustainable financial interventions to restore ecological balance and ensure economic resilience. Based on Bangka Belitung Island’s current conditions, the following is a mapping of its Strengths, Weaknesses, Opportunities, and Threats (SWOT), see table 5.2.

Table 5.3 SWOT of Bangka Belitung Islands

Strengths 1) Geotourism potential: unique post-mining landscapes offer tourism appeal. 2) Economic diversification: tourism revenue increased from idr 58.2b (2018) to idr 63.8b (2019). 3) Rising investment: idr 4.2b (2023) to idr 7.6b (2024). 4) Sector growth: expanding metal and food industries reduce reliance on mining. 5) Job creation: 10,717 people absorbed into various sectors.	Weaknesses 1) Severe land degradation: 15,579 ha damaged; only 299.47 ha reclaimed. 2) Mining dependency: economy still reliant on tin. 3) Water pollution: illegal mining affects aquatic ecosystems. 4) Plastic waste: harms tourism and marine life. 5) Weak agri competitiveness: struggles in market access and sustainability.
Opportunities 1) Sustainable tourism development: eco and cultural tourism potential. 2) Green financing: restoration via green sukuk and carbon funding. 3) Multi-stakeholder collaboration: inclusive partnerships for sustainability. 4) Renewable energy expansion: shift to green economy sectors. 5) Circular economy: improved waste management and recycling.	Threats 1) Illegal mining: continues to degrade ecosystems. 2) Climate change: coastal threats from rising seas and extreme weather. 3) Slow transition: mining dominance delays sustainability. 4) Fisheries decline: marine degradation impacts livelihoods. 5) Tourism competition: competing destinations may overshadow growth.

To address the challenges faced by Bangka Belitung Island, this report outlines the most feasible financing mechanisms, along with their implementation strategies and the necessary steps to ensure their effectiveness, as detailed below.

Market based financing

The Bangka Belitung Islands face serious environmental and socio-economic challenges due to extensive mining. With its economy heavily reliant on mining—both legal and illegal—Bangka Belitung faces profound ecological degradation, water contamination, coastal ecosystem damage, and biodiversity loss.

The need to transition toward more sustainable and diversified economic activities, including geo-tourism and sustainable agriculture, is urgent. Given these realities, Market-Based Financing is the most appropriate mechanism for this province. Instruments such as carbon credits, PES (Payment for Environmental Services), and REDD+ under Market based Financing Mechanism provide clear incentives for communities and businesses to conserve or restore ecosystems while monetizing the environmental services they produce.

To operationalize market-based financing in Bangka Belitung, several implementation steps are recommended. First, identification and mapping of potential PES and carbon sites is crucial to determine viable locations for ecosystem service transactions. This step provides the foundational data to assess environmental value and market potential. Second, pilot development of market-based schemes with local communities can serve as a proof of concept, helping to build trust and demonstrate tangible benefits at the grassroots level.

Next, regulatory alignment and the establishment of institutional frameworks are essential to create an enabling environment for carbon markets. This includes clarifying land tenure, setting standards for carbon accounting, and ensuring transparent governance. Finally, engaging buyers and investors through transparent platforms is key to connecting verified environmental outcomes with financial flows, ensuring credibility and sustained participation from the private sector. This approach enables Bangka Belitung to monetize ecosystem recovery and biodiversity protection while reducing its economic dependency on extractive industries.

5.3.3 Central Sulawesi

Central Sulawesi, strategically located near Indonesia's new capital in East Kalimantan, plays a crucial role in disaster resilience and food security. The province faces significant disaster risks, with 429 earthquakes, 61 floods, 20 extreme weather events, and 10 forest and land fires recorded in 2023 (BPS, 2024). Central Sulawesi has demonstrated steady investment growth, with total investments rising from IDR 3,012 billion (EUR 175 M) in 2021 to IDR 4,772 billion in 2023 (EUR 277 M), reflecting the region's potential for sustainable development through innovative financing mechanisms. Investment realization has been largely concentrated in five key sectors: the basic metal industry (68.11%), the chemical industry (21.03%), housing and office development (6.25%), electricity, gas, and water (1.60%), and the mining industry (0.89%). This upward trend in investment has significantly contributed to employment, with 62,967 individuals absorbed into the workforce.

Central Sulawesi faces a multitude of environmental and socio-economic challenges that require urgent financial intervention. Among the most pressing concerns are illegal logging, which contributes to deforestation and increases the risk of natural disasters such as floods and landslides. Additionally, illegal mining activities have severely polluted local water sources, leading to ecological degradation and public health risks. Another significant issue is the overuse of pesticides, which harms biodiversity and disrupts agricultural sustainability. Based on Central Sulawesi's current conditions, the following is a mapping of its Strengths, Weaknesses, Opportunities, and Threats (SWOT), see table 5.3.

Table 5.4 SWOT of Central Sulawesi

Strengths 1) Strategic location: near the new capital, attracting infrastructure and investment. 2) Rich in natural resources: 4 million ha of forest, marine biodiversity. 3) Investment growth: idr 3t (2021) → idr 4.7t (2023), led by metal & chemical sectors. 4) Employment: 62,967 jobs created. 5) Strong potential: eco-tourism, renewable energy, and sustainable agriculture.	Weaknesses 1) High disaster risk: frequent earthquakes, floods, and extreme weather (2023: 429 quakes, 61 floods). 2) Environmental degradation: illegal logging/mining causing deforestation and pollution. 3) Weak enforcement: poor regulation allows harmful practices to persist. 4) Economic dependence: heavy reliance on extractive industries limits diversification. 5) Infrastructure gaps: inadequate systems for disaster and climate resilience.
Opportunities 1) Strategic location: near the new capital, boosting trade and investment potential. 2) Eco-tourism growth: rich biodiversity supports sustainable tourism and green economy. 3) Green finance access: rising global interest enables funding for climate resilience and renewables. 4) Policy improvement: stronger regulations can curb illegal activities and protect resources. 5) Agri-fishery innovation: sustainable practices can boost food security and rural economies.	Threats 1) Climate risks: rising temperatures and extreme weather threaten agriculture and fisheries. 2) Environmental crimes: ongoing illegal logging, mining, and fishing worsen ecological damage. 3) Land conflicts: competing land use interests may trigger social tensions. 4) Market instability: global price shifts in key industries affect jobs and investment. 5) Health hazards: pollution and pesticide use endanger public health and food safety.

These challenges call for a comprehensive and sustainable financing mechanism that integrates private sector participation, government support, and contributions from donors and philanthropic organizations to promote environmental conservation and disaster resilience. Accordingly, the following section outlines the most feasible innovative financing mechanism to address these issues in Central Sulawesi.

Market based financing

Home to one of Indonesia's richest biodiversity, Central Sulawesi is under threat from illegal logging, pesticide misuse, and coral reef degradation. With a growing economy based on agriculture and fisheries, the region needs financing strategies that reward conservation without sacrificing growth. Therefore, Market-Based Financing is the most fitting mechanism for this region. These tools can strengthen community-based conservation while attracting ethical investment that supports climate resilience and sustainable livelihoods.

To operationalize Market-Based Financing in Central Sulawesi, several key implementation steps are recommended. First, designing marine and forest-based schemes is essential to align conservation efforts with local ecosystem priorities and to create viable, scalable models for community involvement. Second, carbon credit generation from reforestation and marine protection can provide a steady revenue stream while incentivizing environmental stewardship. Third, mobilizing Sustainable and Responsible Investment

(SRI) will attract ethical capital aligned with environmental and social goals. Lastly, building local governance and verification capacity ensures transparency, credibility, and long-term success of market-based initiatives.

These steps collectively empower local stakeholders, promote ecological recovery, and enhance Central Sulawesi's resilience against environmental and economic vulnerabilities. By capitalizing on its ecological assets and growing investor interest, Central Sulawesi can use market-based mechanisms to fund biodiversity preservation while enhancing resilience and economic inclusion.

5.3.4 General implementation roadmap for innovative finance at the regional level

A structured and adaptive implementation framework is essential to ensure the effective deployment of innovative financing across diverse ecological and economic contexts. This strategic roadmap provides a general set of steps that can be tailored to regional characteristics and serves as a guide for the stakeholders.

1. Areas and financial readiness assessment (1–2 months)

This initial phase involves identifying the environmental, social, economic, and regulatory baseline of the targeted region. A comprehensive understanding of these local conditions is essential to ensure that any intervention is context-specific and impactful. The assessment also includes analyzing financing gaps and uncovering potential opportunities to support sustainable development initiatives.

2. Mechanism selection and customization (3–6 months)

In this phase, the most suitable innovative financing mechanism is selected based on the region's unique challenges, opportunities, and institutional landscape. The chosen mechanism is then carefully customized to enhance its feasibility, ensure strong local ownership, and align with existing policy and regulatory frameworks.

3. Institutional design and stakeholder policy integration (7–9 months)

This stage focuses on designing a collaborative governance structure that facilitates effective stakeholder coordination. It also involves integrating the mechanism into local policy frameworks to enhance alignment and accountability. Capacity building and policy coherence efforts are carried out to empower stakeholders and strengthen institutional support.

4. Pilot project development and proof of concept (10–12 months)

Pilot projects are developed to implement the selected financing mechanism in real-world settings. These pilots serve to test the feasibility, effectiveness, and scalability of the model. By gathering on-the-ground evidence, this step helps validate the concept and provides insights necessary for future expansion.

5. Scaling up (up to 12 months and beyond)

Once the pilot proves successful, efforts shift toward institutionalizing the model across the region or in other relevant areas. Scaling up is supported by strategic policies, investment mobilization, and local capacity enhancement. Broader impact is pursued through partnerships and network building to ensure long-term sustainability.

This strategic framework offers a flexible yet comprehensive approach to designing and operationalizing innovative finance mechanisms at the sub-national level.

6. Conclusion

This study explores the vital role of innovative financing in advancing climate resilience and biodiversity conservation in Indonesia, particularly within the Landscapes and Seascapes (LaS) context. The research is driven by the pressing need to mobilize alternative funding sources beyond the state budget to address the nation's complex environmental challenges. The Sustainable Land and Seascape Initiative (SOLUSI) program serves as the focal point of this study, with priority implementation in Central Java, the Bangka Belitung Islands, and Central Sulawesi—regions that reflect Indonesia's ecological diversity and distinct local challenges.

Indonesia has adopted a variety of innovative financing mechanisms, including Market-Based Financing, Sustainable Government and Private Financing, Public-Private Partnerships (PPPs), Blended Financing, and Donor and Philanthropic Financing. Together, these represent a comprehensive national approach to sustainable development.

However, analysis of the current regulatory landscape reveals key gaps. While some environmental protection regulations are robust in design, they often lack enforcement, infrastructure support, and inter-agency coordination. Compounding these issues are limited local funding, weak community engagement, and insufficient environmental education across sectors.

Through focus group discussions and in-depth interviews with stakeholders, the study identified implementation challenges in the three priority areas. Chief among them are high operational costs and limited access to environmental funding, particularly at the local level. To address these barriers, the study recommends strengthening public support mechanisms, enhancing education and outreach, and establishing a clear, structured framework to facilitate fund mobilization and access—especially for communities and small businesses.

The involvement of government bodies, international organizations, NGOs, and the private sector is essential for developing and applying innovative financing instruments. However, challenges persist, including limited regulatory incentives for green bond issuance and a general lack of focus on green and circular economies. To overcome these obstacles, the study calls for expanded incentives for companies and financial institutions, as well as dedicated funding programs to promote sustainable economic growth—especially in priority regions.

At the national level, the study emphasizes the importance of Sustainable Private Financing and Market-Based Financing mechanisms. These approaches are critical for bridging the funding gap and ensuring long-term financial sustainability. Sustainable Private Financing attracts private capital through impact and sustainable investments, while Market-Based Financing strategically combines public and private resources to de-risk investments and scale up financing for biodiversity and climate resilience initiatives. This mechanism operates more efficiently by allowing the market to determine prices and allocate resources based on supply and demand, ultimately finding its own equilibrium.

In conclusion, achieving national strategic objectives in innovative financing requires strong, multi-stakeholder coordination—across government, international bodies, NGOs, and the private sector—underpinned by clear and comprehensive regulatory frameworks. Finally, addressing regulatory bottlenecks, improving cross-sector coordination, designing targeted implementation strategies, and building local capacity are essential to unlocking the full potential of innovative financing in supporting sustainable development throughout Indonesia.



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