

POLICY BRIEF:

Investing Opportunity in Mangrove Restoration Program

SEPTEMBER 2022



Table of Contents

Contents

Summary and Key Messages	3
Forewords	4
Introduction and Context	6
The significance of mangroves and their restoration investment	6
Return on investment of mangrove restoration	7
The purpose of the Policy Brief	9
Mangrove Restoration in Indonesia: Scale and Strategy	10
Mangrove restoration target in FOLU Net Sink 2030	11
Policy direction for mangrove protection and restoration	12
Preparing mangrove restoration investment	14
Mangrove Restoration Investment	19
Building up mangrove conservation and restoration investment	20
The ‘Preliminary Stage’ of investment	24
Transition-stage mechanism	27
The advance stage - scale up with various funding sources and revenue streams	28
Financial resource for investment	30
Key takeaways	34
Conclusion and Recommendation	35
Conclusion	35
Recommendation	36
References	37

Summary and Key Messages

Mangroves provide a vital link between terrestrial and oceanic carbon cycles and are one of the most carbon-dense vegetated ecosystems globally, due in part to their high rates of carbon sequestration compared to other ecosystems. The value of mangroves restoration extends far beyond climate change mitigation, they support communities and biodiversity resilience by regulating nutrients, sustaining fisheries, and protecting coasts from storms.

Conservation and restoration of mangroves provide an important opportunity for climate change countermeasure. Restoring 1.6 million hectares of disturbed and degraded mangrove in Indonesia to a healthy state would reduce emission up to 59.4 million tons of CO₂ emissions over the next 10 years, and open the door to new economic opportunities such as carbon economy, eco-tourism, and sustainable fisheries.



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The advantages of the private sector and financial institutions investment to scaling up mangrove restoration are their leverage to push for faster change through engagement and capital allocation. This trend is expected to strengthen as the new generations of investors, increasingly aware of the environment, social, and governance (ESG) issues, seek investments aligned with their values. Equally, the project itself would profit from the same rigorous approach to project diligence, selection, and feasibility assessment, as done in standard portfolio management.

The government and financial services regulator need to create a supportive enabling environment with efficient and effective incentives, standards and regulations, improved data management, and concessional finance. For the interest of the private sector, nature risks stemming from both impact and dependency on healthy mangroves can be incorporated into investment decisions through risk measurement and reporting. This will encourage financial services to operate with consideration of their financing decision impacts on businesses sustainability and ecosystem integrity (greening finance). In addition, more innovation in finance in developing projects with sufficient cash flow and returns, as well as financial instruments with an attractive risk-return profile, is needed (financing green).

Forewords

The mangrove ecosystem is an important concern, for the government in particular, and also for us all, for the rehabilitation and restoration of mangroves.

Mangroves play a natural role as trapped pollution, spawning, and nursery ground. So that this is in line with the vision and mission of the Government of Indonesia which places the mangrove ecosystem as a carbon sink (blue carbon) so that it can support NDC and Indonesia's FOLU Net Sink 2030.

The Indonesian Chamber of Commerce and Industry through the Environment and Forestry Sector (KADIN Indonesia-LHK) at the Standing Committee for Watershed Control and Protected Forests, is currently inviting the involvement of multi-stakeholders to participate and work together in the management of mangrove restoration and rehabilitation in Indonesia. In particular, the Indonesian Chamber of Commerce and Industry invites the private sector to contribute to the Investment-Friendly and Sustainable Mangrove Restoration Program, which focuses on discussions and joint actions in the future, how to form and model multi-stakeholder collaboration, and the roles and authorities of these multi-stakeholders in mangrove management in Indonesia.

Efforts to improve ecosystem services from mangrove restoration and rehabilitation are an important part of climate change adaptation because they include nature-based solutions that will increase the resilience of coastal areas, including urban infrastructure and the economy as well as the livelihoods of coastal communities. The lesson learned from various mangrove restoration programs is that the program must involve local communities and align local economic interests with mangrove conservation and restoration starting from the planning stage. Continued engagement will empower local beneficiaries to play an active role in decision-making about mangrove use and recognize the needs and priorities of different stakeholders.

This multi-stakeholder involvement is expected to be able to fill each other's space and provide perspectives from each field according to their competence in realizing cooperation for mangrove restoration and rehabilitation that is investment-worthy and sustainable in realizing a low-emissions industry as well as the commitment of the Government of the Republic of Indonesia in achieving NDC and also Indonesia's FOLU Net Sink 2030.

Silverius Oscar Unggul

Deputy General Chairperson for Environment and Forestry of the Indonesian Chamber of Commerce and Industry

Indonesia has recognized the growing climate emergency and the severe risk posed to its economic development and citizens' well-being.

Nature-based solutions such as mangrove restoration and rehabilitation are considered a win-win investment opportunity, providing economic and social returns through mitigation and adaptation solutions to climate change while contributing to emission reduction and the Sustainable Development Goals.

Filantropi Indonesia believes that there is a need for broader multi-stakeholder partnerships to accelerate collective action and complement resources to achieve our shared goals.

This publication emphasizes the importance of co-creation, collaboration, and collective action in restoring and rehabilitating the mangrove ecosystem. We hope that business and philanthropy pursue a science-based approach and work collaboratively to enable achieving mangrove restoration and rehabilitation at scale.

Rizal Algamar

Chair of the Board of Executive
Filantropi Indonesia

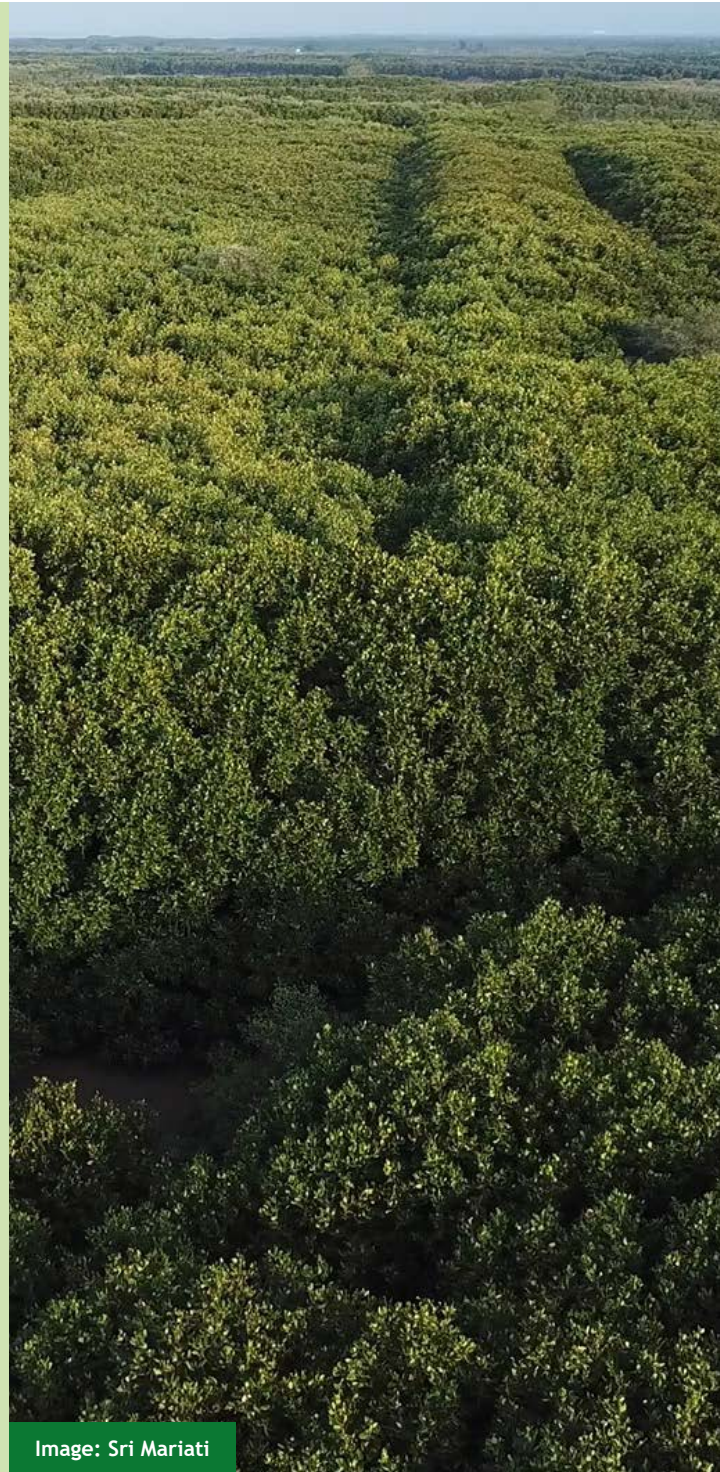


Image: Sri Mariati

Introduction and Context



Image: Sri Mariati

The significance of mangroves and their restoration investment

Mangrove ecosystems are important coastal ecosystems that support the productivity of the coastal zone within the tropics and subtropics. These ecosystems provide multiple ecosystem services estimated to be worth around US\$33 - 57 thousand per hectare (UNEP-WCMC, 2021),ⁱ and play an important role in climate change mitigation and adaptation with their capacity to sequester and store carbon.

Mangroves are a key component of livelihoods in coastal communities, providing important sources of food and income. Approximately 55% of the total capture fisheries in Indonesia with a total annual production of US\$825 million, consists of species that depend on the existence of mangrove ecosystems (World Bank, 2022).ⁱⁱ In the nature tourism sector, mangroves generate the value of almost US \$ 30 million per year. The total value of environmental goods and services for mangrove ecosystems in Indonesia contributes to the national economy worth at least USD 1.5 billion annually (World Bank, 2020).ⁱⁱⁱ

Despite the magnitude of benefits of mangrove ecosystem, during the last five decades, a vast area of mangroves in Indonesia, the home of the largest mangrove area in the world, faced rapid degradation and land use conversion (Friess and Webb, 2014; Giri et al., 2010).^{iv} Coastal ecosystems that were damaged are often lost forever and their ecosystem services are seriously impaired. It is estimated that over 35% of the world's mangroves have disappeared over the last five decades (Valiela et al., 2001).^v



Return on investment of mangrove restoration

There is a growing need for coastal and marine restoration, but it is not clear how to pay for it given that environmental funding is low, and national budgets are stretched in response to natural hazards.

Mangroves restoration needs multiple approaches that comprise multisectoral and spatial scales, and massive resources including funding. Restoration of mangroves has been practiced for decades¹ with various rationales that reflect specific ecosystem goods and services, including improve timber yield and maintenance of forest stands for sustainable timber production, coastal protection, landscaping (tourism), conservation of biodiversity, or mandated by regulation/law,² and more recently to offset carbon emissions.^{vi}

The role of mangrove's blue carbon is steadily gaining attention as a key natural climate solution (Macreadie et al., 2019; Vanderklift et al., 2019).^{vii} The value of mangroves extends far beyond climate change mitigation, they support communities and biodiversity resilience by regulating nutrients, sustaining fisheries, and protecting coasts from storms.³ Therefore, valuing those services in economic materiality should be an important part of investment and business decisions.

Proxy analysis using risk-industry methods (such as insurance industry) finds that coral reef and mangrove restoration could yield strong Return on Investment (ROI) for flood risk reduction on shorelines infrastructure, housing estates and coastal-based economic activities. These results are robust to changes in discount rates and the timing of restoration benefits.⁴ Data on restoration costs are sparse, but the Present Value (PV) of restored natural infrastructure shows that ROI would be positive in many locations even if restoration costs are in the hundreds of thousand dollars per hectare for mangroves and millions per km for reefs (Beck et al, 2022).

Mangrove and reef restoration can be cost effective (B:C > 1) for flood reduction in more than 20 Caribbean countries. Restored natural infrastructure can provide \$100,000s/ha in flood protection benefits over project lifetimes. These rigorous valuations of natural defences open new opportunities to fund coastal restoration. Funding from hazard mitigation and disaster recovery sources can support habitat restoration. The study, published in the journal *Ecosystem Services*,⁵ provides rigorous valuations of these natural defences and show that they can deliver a positive return on investment, with the benefits from reduced flood damage exceeding the costs of restoration.

¹ Noticeable reviews by Lewis, 1982, 2005, 2009; Field, 1998; Ellison, 2000; Lewis et al., 2019.

² e.g., local regulations mandating "No Net Loss" of wetlands following development projects.

³ See previous Policy Brief by KADIN and Filantropi Indonesia 2022: Promoting a Viable and Sustainable Mangrove Restoration Program.

⁴ University of California-Santa Cruz. News Caner. Study shows mangrove and reef restoration yield positive returns on investment for flood protection A robust analysis demonstrates that nature-based solutions to reduce the damage caused by coastal flooding are cost-effective. June 17, 2022 By Tim Stephens.

⁵ Beck, M.W., Heck, N., Narayan, S., Menéndez, P., Reguero, B.G., Bitterwolf, S., Torres-Ortega, S., Lange, G., Pflieger, K., McNulty, V.P., Losada, I.J. (2022) Return on investment for mangrove and reef flood protection, *Ecosystem Services*, Volume 56, 2022, 101440, ISSN 2212-0416, <https://doi.org/10.1016/j.ecoser.2022.101440>.



Image: Unsplash.com

Case of Zephyr Power Limited in Pakistan

British International Investment (BII) provided both debt and equity financing to Zephyr Power, a renewable energy company in Pakistan. The investment was the first time BII provided both products together to an investee company. Zephyr Power's 50MW wind project in the Gharo-Keti-Bandar Wind Corridor near Karachi is situated in a region of degraded coastal marshes, which exposes the project's infrastructure to climate-change risks, particularly coastal erosion and sea-level rise. The analysis identified and quantified three areas of value for the investment: the protection of physical assets, community development and social license to operate, and regulatory requirements by international investors. Overall, the evidence suggested the investment in mangrove restoration would return up to 20 times its value through the protection of physical assets against coastal erosion, saving the project up to \$7 million in maintenance costs over the project's 25-year timeframe, as well as creating a substantial local impact on livelihoods by doubling the incomes of local communities dependent on subsistence farming.

Sources: <https://www.bii.co.uk/en/news-insight/insight/articles/investing-in-natures-assets-the-case-for-mangroves-as-a-nature-based-climate-solution/>

Other assessment also provided by "Financing the Earth's Assets: The Case for Mangroves as a Nature-based Climate Solution"⁶ outlines the potential of mangrove forests to slow global warming, shield against extreme weather events, help stop the runaway extinction of biodiversity, and support local economies. Global investment in mangrove regeneration could return \$11.8 billion by 2040 if carbon markets were to reflect the true value of nature, according to this report.

Investing in mangrove restoration also could provide non-financial ROI; it provides business the opportunity for a high value proposition of Environment, Social, and Governance (ESG) strategy beyond CSR. Private sector actors can provide financial capital needed to execute mangrove restoration and sustainable forest management strategies. It is expected that the capital provided by the private sector be carried out with a business approach that is more efficient in addressing the needs of mangrove restoration.

The ESG topics are increasingly recognised and becoming financially quantifiable.⁷ A large and growing proportion of investors are incorporating ESG considerations into their investment decision. Investors' decisions are increasingly aligned around credible information on a company's strategic approach and efforts towards key ESG-related topics, i.e., the efforts of businesses in improving environmental quality, social resilience, and strengthening fair resource governance throughout their value chains. This policy brief attempts to inform that restoring mangroves covers the three fundamentals of ESG and that the investment a business made in mangrove restoration is an investment to securing its long-term sustainability.

⁶ https://earthsecurity.org/wp-content/uploads/2020/12/2128_ESG_mangrove_22.pdf

⁷ <https://corp.gov.law.harvard.edu/2018/05/10/materiality-matters-targeting-the-esg-issues-that-impact-performance/>

The purpose of the Policy Brief

This policy brief is exploring the benefits of investing in mangrove restoration through public and private financing, from conservation financing, SDGs funding, and carbon financing instruments.

An investor-driven approach to conservation finance has the potential to preserve and restore these unique yet vital ecosystems. If such investments can be scaled up and developed there could be ample capital to finance large-scale, high-impact ecosystem restoration.

While the Government of Indonesia has developed policies and regulations to protect and maintain natural resources for the welfare of the people, the resources to finance ecosystem restorations in the current state could not be met by the state budget alone. The government also strive to mobilize financial resources through bilateral, regional, and international channels, including grant, result-based payment for reducing deforestation and forest degradation program (REDD+), and other potential sources and mechanisms.



Image: Unsplash.com

The objectives of this policy brief are:

- 1 For businesses and investors can participate in mangrove rehabilitation to accelerate the achievement of the forest and other land use sector net sink target by 2030 (FOLU Net Sink 2030) in a cost-effective manner;
- 2 Concisely assess the restoration investment issues and the policy options and to explore financial resources and mechanisms for mangrove restoration with long-term impacts on the ecosystem and social resilience as well as climate benefits.
- 3 Business communities are aware and understand the economic and investment lens to consider greening their value chains through investing in mangrove restoration as an ESG proposition, protecting biodiversity, and offsetting their carbon footprint;
- 4 Assess the opportunities for philanthropy donors and foundations to collaborate with concessional and commercial investors and development finance to support effective outcomes and ensuring the long-term environmental, social and economic impact of mangrove restoration;
- 5 Exploring mangrove restoration investment opportunities that appeal to business and financial sectors with possible gains from a carbon economy to generate returns with a real, quantifiable, and positive impact on climate change mitigation and socio-economic resilience of the communities.

Mangrove Restoration in Indonesia: Scale and Strategy

The restoration of Indonesia's mangroves is a significant strategy to mitigate climate change. Mangroves' carbon sinks potential and biomass accumulation gives significant contribution to coastal sediment burial of up to 24 tera grams (million tons) carbon storage per year globally (Alongi et al, 2016, Alongi, 2014).^{viii} The carbon stored by world's intact mangroves reaches 17 % of the world's "blue carbon"⁸. This equal to the emissions generated by 1.5 billion cars on the road per year (BPD LH, KLHK dan BRGM, 2022).^{ix}



Image: Shutterstock.com

Restoration and rehabilitation of degraded mangroves provide an important opportunity for climate change countermeasure, which will not only sequester considerable amounts of atmospheric carbon but also restore the vast array of ecosystem services provided by healthy mangroves. Mangrove conservation and restoration⁹ is the key to preserve the coastal carbon sink habitats. At the 26th Meeting of the Conference of the Parties to the UN Framework Convention on Climate Change in Glasgow (COP26 Glasgow), President Joko Widodo announced a commitment that Indonesia pursues a net sink target for the Forest and Other Land Use sector by 2030,¹⁰ including rehabilitating 600,000 hectares of mangrove.

The program is supported by Presidential Regulation Number 120 of 2020, which broadened the mandate of the Peatland Restoration Agency with coordinating and facilitating mangrove rehabilitation (become Peatland and Mangrove Restoration Agency or Badan Restorasi Gambut dan Mangrove/BRGM) and extended its mandate until the end of 2024. In 2021, the Gol launched the updated National Mangrove Map signalling government's intent to improve the quality of mangrove forest monitoring and the ability to measure progress in mangrove management efforts and adopt an overarching policy on sustainable management and conservation of the mangrove ecosystem.

⁸ Blue carbon is organic carbon sequestered and stored over long timescales by coastal vegetated ecosystems such as mangrove forests, seagrasses, and saltmarshes

⁹ This encompasses the care, rehabilitation, afforestation and reforestation, sustainable use and management, maintenance, and protection of mangrove ecosystems.

¹⁰ Known also as Indonesia's FOLU Net Sink 2030.

Mangrove restoration target in FOLU Net Sink 2030

The FOLU Net Sink 2030 Operational Plan targets mangrove comprise of the existing mangrove area and the potential area of the mangrove habitat.¹¹ Based on National Mangrove Map 2021, the existing mangroves in forest areas is around 2.7 million hectares comprise of mangroves in the production forests, protection forest, and conservation forest and around 700 thousand hectares lays on non-forest land (APL) which spread over 257 districts/cities.^x

Besides the existing mangroves, the FOLU Net Sink target also includes the potential area for expanding mangrove habitat. This potential habitat comprises various land types, i.e., unproductive/abandoned aquaculture farms (ponds), accretion coastal sediment, open areas, abraded mangroves, and abraded coastal land. Rehabilitation activities in abandoned ponds with clear land rights, open areas, and emergent land would be carried out following the designation in the Zoning Plan for Coastal Areas and Small Islands (KKP, 2022).¹²

Outside those areas, there could be areas for mangrove planting to develop a natural fortress against storm and sea waves abrasion for seafront housing and other infrastructure and to attract tourism activities. For this type of investment, generally the cost of establishing mangroves is covered in the overall investment for the infrastructure construction and park (tourism) development and management.

Figure 2 provides a summary of the mangrove distribution including the existing mangrove areas as well as the potential reclaimed mangrove based on land use and allocation.

Considering the scale and distribution of the mangrove target area, prioritizing the restoration is placed on the most impactful results. The priority for rehabilitation is for mangroves with a medium and low-density cover that in the absence of immediate intervention might further degrade and deteriorate their ecosystem services. The subsequent priority is for the potential mangrove habitat to establish mangrove ecosystems and protect the coastal area/ infrastructures from abrasion.

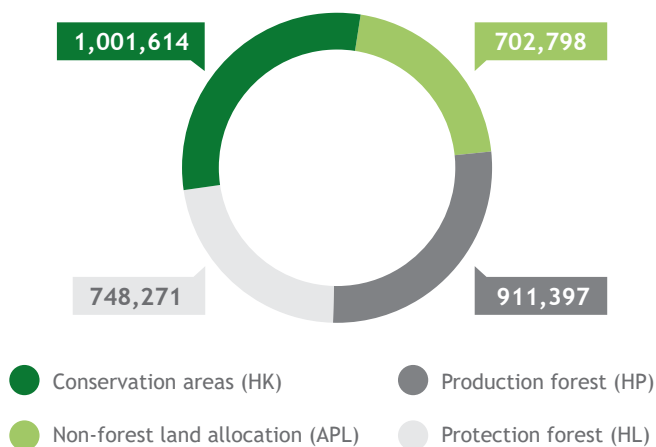


Figure 1. Land use allocation of existing mangrove (hectares)

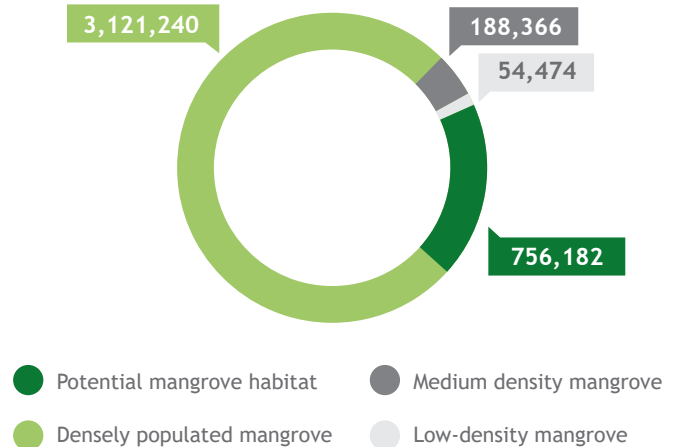


Figure 2. Mangrove vegetation cover density distribution (hectares)

¹¹ Adopted from the 2021 Peta Mangrove Nasional (PMN) update, the potential rehabilitation area of mangrove habitat is 756,183 ha. <http://ppid.menlhk.go.id/berita/siaran-pers/6225/peta-mangrove-nasional-tahun-2021-baseline-pengelolaan-rehabilitasi-mangrove-nasional>

¹² Law Number 27 of 2007 in conjunction with Law Number 1 of 2014 concerning Management of Coastal Areas and Small Islands, Minister of Marine Affairs and Fisheries Regulation Number 23/MEN/2016 of 2016 concerning Management Planning for Coastal Areas and Small Islands

Policy direction for mangrove protection and restoration

The Government uses spatial analysis in the Spatial Based Program Planning Integration at the Site Level (KLHK, 2021)¹³ to determine the FOLU Net Sink operational plan to ensure an effective strategy for a significant reduction in the deforestation rate, to align policies direction of environmental and forestry development with sustainable development goals (SDGs), and to ensure the actions in reducing greenhouse gas emissions involves the participation of the local community in forest management and all parties involved has a fair share of responsibilities and benefits.

Government Regulation Number 23 of 2021 concerning Forestry Governance is applicable for mangroves that are located in the forest area. The forestry sector policy and regulation govern to control of the allowable

utilization of mangrove forests, their protection, and conservation under different forest allocation and designation (HP, HL, and HK). Later in the year 2021, the Minister of Environment and Forestry issued a regulation concerning forest management and preparation of “Forest Management Plans”, as well as forest utilization in protection and production forests that become the reference for permits holder for Forest Utilization Business Permits (Perizinan Berusaha Pemanfaatan Hutan/PBPH).¹⁴

Mangrove rehabilitation could also be carried out as projects and/or as part of projects in the coastal areas applicable to both forest areas and non-forest land allocation. The rehabilitation of mangroves outside the forest and plantation/fishery concession areas could be carried out by the government (national and regional), private sector, community groups, and NGOs/CSOs working together with the community and donors (including CSR, funding organization and individual/institutional philanthropy).

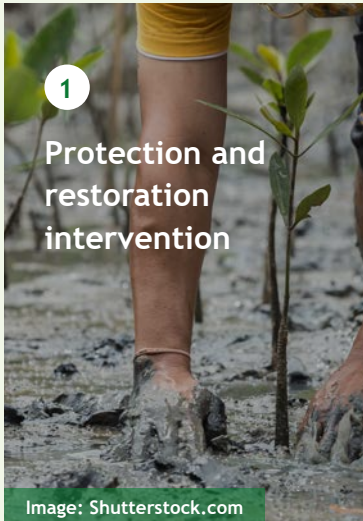


Image: Shutterstock.com

¹³ Biro Perencanaan KLHK, 2021 Integrasi Perencanaan Program Berbasis Spasial pada Tingkat Tapak untuk Mencapai Target Pembangunan KLHK

¹⁴ Regulation of the Minister of Environment and Forestry Number 8 of 2021 concerning Forest Management and Preparation of Forest Management Plans, as well as Forest Utilization in Protection Forests and Production Forests. Further elaborate by PerDirJen PHL No.1/2020) regarding Innovative policy for forestry multi-business models that regulates the issuance of permits for PBPH (forest utilization business permit).

Possible interventions for mangrove protection and rehabilitation in different vegetation covers and land uses/allocation:



This model is applicable for both the protection and restoration of mangroves. The business model aims for financial and other biodiversity and ecosystem benefits as well as community development. Estimated carbon emissions reductions following the initial restoration of degraded mangroves have to be assessed thoroughly, including the methodology for measurement, maintaining long-term project activities through community development components, etc. Restoration included activities such as hydrology management including the construction of mud-trap to maintain carbon-rich soil and substrates for new mangrove vegetation, plantlet protection, and planting.



Applicable for forest areas and non-forest coastal area with for-production land use. Ecosystem service intervention covers the protection of intact mangroves and enrichment of mangrove vegetation for tourism and/or infrastructure protection. Establishing mangroves as natural barriers and attractions has a different cost structure and might add up to the main construction cost. The annual cost was implied for activities such as patrol, monitoring, and maintenance. In reality, these activities are labour intensive, which will include community engagement to ensure community ownership for project outcomes and maintenance.



Applicable to non-forest coastal areas potential for mangrove expansion. Mangrove artificial revegetation is intended for tourism and/or infrastructure protection. Establishing mangroves as natural barriers and attractions has a different cost structure and might add up to the main construction cost. The annual cost was implied for activities such as patrol, monitoring, and maintenance. In reality, these activities are labour intensive, which will include community engagement to maintain mangrove vegetation and also benefit from coastal fisheries and tourism activities.

In all the three options above, the revenue streams could be generated from emission offset (through verified emission reduction or payment for performance), NTFP and sustainable fisheries product sales, as well as visitor fees.

Preparing mangrove restoration investment

Development of a systematic restoration plan

A framework for the restoration of mangroves (Figure 3) provides general approaches and steps applicable to different conditions and land uses by emphasising three major issues, i.e., identifying and addressing the causes of degradation to prevent further degradation of the existing mangroves, developing a detailed practical guideline for the executors of plans for the restoration of degraded mangroves and developing a robust measurement-reporting-verification system for high-quality emission reduction benefits. The issue of community access to and use of mangroves should be addressed to ensure sustained community participation and this can be encouraged by promoting the livelihood and sustenance of coastal communities.



The restoration plan may emphasize ecological engineering based on the findings of ecosystem assessments. Mangrove conservation and restoration programs at scale require a long-term strategy of improving coordination among institutions, collaboration with coastal communities, capacity building to manage mangroves, and enhancement of the value of mangroves to local people.¹⁵ Therefore, creating an investible project with buy-in from the local community and supported by the local, regional and national government is vital. Some strategies of immediate improved livelihood program and establishment of a self-sustaining mechanism (for sustainable financial return) can ensure society/people participation.

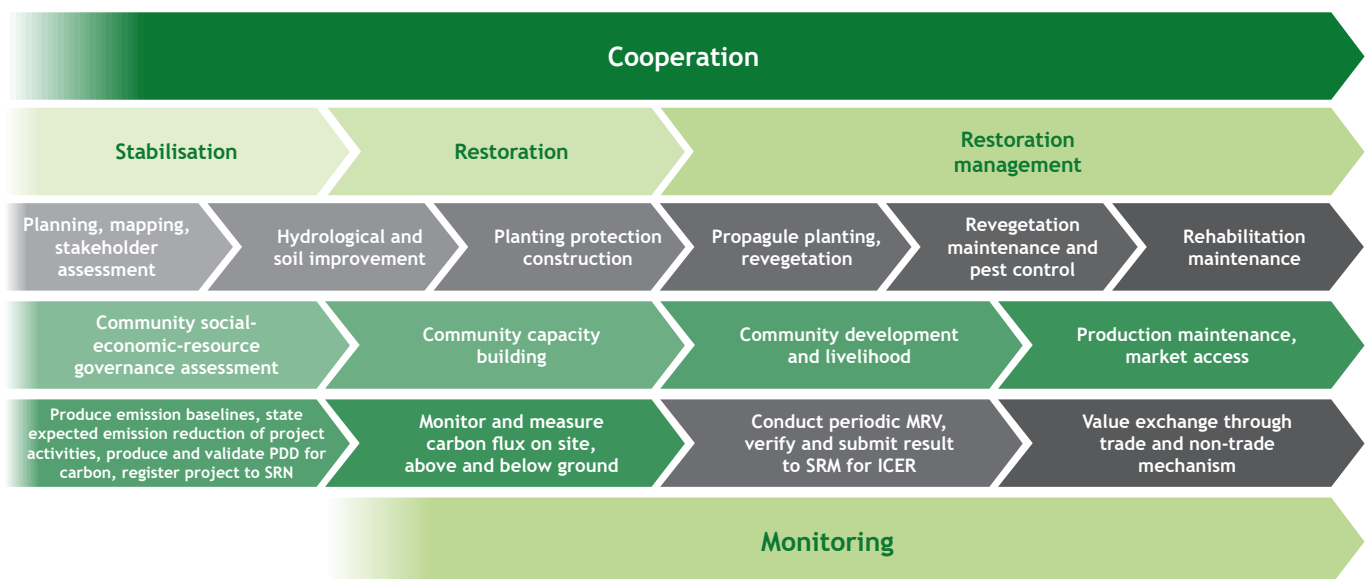


Figure 3. Mangrove restoration framework

¹⁵ See the previous policy brief “Promoting a Viable and Sustainable Mangrove Restoration Program”



Image: Unsplash.com

Scaling up conservation projects into investable programs will require a professional management approach that fosters economic-ecosystem connectivity, sharing of best practices, and rapid replication. The nature and experience of private sectors and businesses in managing large for-profit projects will have an advantage in this issue. And for community engagement as well as expertise in working with conservation issues, the project should seek support from a non-governmental organization (NGO). Finally, the local communities involved in such projects often need to develop more business acumen and financial literacy to roll out projects at scale and be able to effectively participate in their development.

Community involvement and development plan

Community development issues should be addressed as part of solutions to the underlying causes of mangrove degradation. It must ensure addressing both preventive and curative measures at the same time. In initiating any community-based restoration, it is necessary to survey the choice and preferences of the local people because they will be the first beneficiaries but also run the risk to suffer the most should the project fail. Community involvement and development plan may focus on the stages and level of community participation, the major issues in community livelihood, and strategy for livelihood improvement of adjoining communities during mangrove restoration progresses. At the early stages of the project, financial support is needed, but it is desirable that over time, a self-sustaining mechanism is developed so that the community can sustain its livelihood and restoration efforts when the project is finished.



Image: Shutterstock.com

The Cost structure of mangrove restoration activities

Cost estimates for mangrove restoration projects from the Government of Indonesia hover close to the median global cost estimates. The total cost for one hectare of mangrove rehabilitation with artificial regeneration (planting 10,000 propagules) is about US\$ 3,550, which includes paying for mangrove propagules, planting facilities and infrastructure, and the work of planting (Ministry of Marine Affairs and Fisheries). On top of this amount, additional investments might be required for community training, the construction of semipermeable dams, and mangrove tourism infrastructure. This assessment combines the additional cost for restoration at US\$ 3,863 per hectare.¹⁶

In estimating mangrove restoration financing needs, there has been limited granularity of analysis. It is well understood that there are (i) location specific costs, (ii) location specific commodities, and (iii) actor specific variables. The intention is to have a headline figure accurate enough for initiating discussion towards action. Mangrove restoration cost does not consist of initial intervention activities only but also relies on the subsequent recurring costs and transformative business models to ensure real restorative results and permanence (see Figures 3). The mangroves sub-sector target in the FOLU Net Sink Operational Plan encompasses a multitude of areas operated by different actors and jurisdictions, thus making consensus and cooperation is an ongoing effort.

Implementation of plans

During the implementation of restoration activities, the project should be equipped with sufficient technical experts, including experts on community development relevant to the local existing community social-economic-capacity profiles. The project has to consider the local community as an integral part of the implementation and therefore the project should strive to ensure that the role of the local community should be a positive and active one. The project should also engage and build the capacity of the local communities to implement monitoring, including the certain capacity to monitor and measure the mangrove growth. Capacity building may be necessary for the successful implementation of such a program; a micro-level area specific ‘restoration and community development plan’ should be prepared in line with the larger plan.

The carbon economy is the key to restoration at scale.¹⁷ To truly enable large-scale mangrove restoration, it is critical to unlock significant amounts of carbon finance from both domestic and international sources. Carbon projects implementation would incur initial setup activities such as project designing, implementation of the monitoring system, and training and community setup. The measurement, Reporting, and Verification (MRV) process was considered in the project design as the process would assess how much emissions reduction is available during the project duration. Validation cost was also incorporated as emission reductions

¹⁶ The World Bank Technical Report the Economics of Large-scale Mangrove Conservation and Restoration in Indonesia. 2022.

¹⁷ Carbon Trading is a market-based mechanism to reduce GHG Emissions through buying and selling Carbon Units. A carbon Unit is proof of carbon ownership in the form of a certificate or technical approval stated in 1 (one) tonne of carbon dioxide recorded in the SRN PPI. Emission Trading is a transaction mechanism between Business Actors whose emissions exceed the specified Emissions Upper Limit.

must go through quality assessment and a certification body (i.e., VCS or Verra) to determine how many emission reduction units could be transformed into credits. Once the quantity of supply was validated, the verification of carbon units and compliance could be processed. In reality, validation and verification are big cost components.

There will be different cost structures for project development under different types of land use, interventions, permits, and business model. Those cost cover project development, implementation, and aggregation and sales of credit (carbon) and blue economy products.

STAGE 1: Project Development

The outcome of Stage 1 above is the approval of the project and obtaining a registration number for the project.

- a. Site selection and obtain permits for the project, pre-feasibility study, measurement and verification of biodiversity and/or ecosystem services (carbon) to create baseline and project concept note,
- b. Base on concept note document, the project developer conducts community engagement, feasibility study on the business model, business planning, and engages funding resources (fundraising),
- c. engage market access players for possible future product offtake and technical assistance to maintain product quality,
- d. development of project design document (PDD) including the business model and processes, investment plan and community development plan,
- e. validation of PDD by a certified 3rd party auditor, and
- f. registers the project to National Registry System (by the project owner or person in charge) and fills the general data form for their climate change activities.¹⁸

Image: Shutterstock.com

¹⁸ National Registry System on Climate Change is a web-based management of data and information system for action and resources of climate change adaptation and mitigation in Indonesia. <https://srn.menlhk.go.id/index.php?r=home%2Findex>

STAGE 2: Project Implementation

The outcome of Stage 2 is certified emission reduction (ICER)¹⁹ and other benefits.

Image: Shutterstock.com

- a. Proceed with site protection and securing the project site from further mangrove degradation and its habitat (soil management),
- b. water management and preparing revegetation materials and protection,
- c. assisted revegetation and replanting as necessary (reforestation),
- d. community development assistance (tourism, aquaculture, other products from mangroves),
- e. general management including measuring the emission reduction performance and improvement of socio-economic condition of the community,
- f. report emission reducing performance to SRN for verification and credit.

STAGE 3: Aggregation and Sales of Credit

The outcome of Stage 3 is project maturity with revenue streams from sales of carbon offset credit and other commodities to self-sufficiency to maintain the operational costs and community-business development.

Image: Shutterstock.com

- a. determine project area and impact area of the project to develop baselines impact measurement,
- b. raise capital through pre-sales of VER (verified emission reduction),
- c. monitor performance across jurisdictions and identify priority areas for management focus,
- d. undertake audits by Validation and Verification Bodies (VVB),
- e. report to SRN for any carbon credit transaction.

Alternative business models can generate profitable financial returns, and also build environmental impacts such as reduction in carbon emission and protection of coastal regions (improve resilience from the impact of climate change) and a sustainable blue economy. Long-term incentives which can be provided through the sale of mangrove-related goods and services, such as certified organic shrimp or sustainably harvested

crab, coastal protection services from insurance, and carbon offset payment could then be partly used for operational costs to maintain the project running. A successful intervention is dependent on the selection of suitable financial mechanisms and buy-ins from stakeholders in the area which consist of the public and private sectors.

¹⁹ Each ICER (Indonesian Certified Emission Reduction) issued for a particular mitigation action will be added to the account of the person in charge/implementer of the action in the SRN.

Mangrove Restoration Investment



Image: Sri Mariati

Due to the broad effect of mangrove disturbance, degradation, and loss, efforts have been made to restore and preserve mangroves globally.²⁰ There is potential to mainstream mangrove rehabilitation into a variety of state or public funding schemes, i.e., state infrastructure and/or health budget, disaster mitigation, and sectoral socio-economic development (forestry, marine and fisheries, environmental management). The budget tagging on climate finance for mitigation and adaptation might provide information for improving sectoral state and regional budget allocation for mangrove protection and sustainable management.

Opportunities to boost climate change mitigation and adaptation (CCMA) and sustainable financing may lie in enhancing blue carbon sequestration returns, particularly in the area where coastal ecosystems

are extensive and national and international carbon markets offer comparatively attractive payments for environmental stewardship.²¹ For example, 20% of the world's mangroves may qualify for carbon-credit schemes, and 10% may be profitable, potentially generating US \$1.2 billion per year in carbon benefits (Zeng et al., 2021).^{xi} Matching this potential supply, there is rapid increase in demand from industry and government interest in the potential of protecting and restoring blue carbon ecosystems as NCSs. Several major international corporations—such as Apple, HSBC, and BHP—have announced their intentions to include blue carbon within their carbon-abatement portfolio,²² while some countries (e.g., Australia, USA, and UAE) have already incorporated blue carbon into their nationally determined contributions (NDCs) under the Paris Agreement (Herr and Landis, 2016).^{xii}

²⁰ Spalding, Mark D and Leal, Maricé (editors), 2021 The State of the World's Mangroves 2021. Global Mangrove Alliance.

²¹ The GOI has recently issued several of policies that open opportunities to increase new and innovative financial resources through the Carbon Economic Value Policy.

²² Macreadie et al, 2021

Building up mangrove conservation and restoration investment

Business sometimes has limitations in engaging certain components of project interventions that comprise community capacity building and social safeguard. The role of community groups, NGOs, CSOs, and philanthropic foundations can bridge this challenge and assure that the objective of business investment is upheld, including ensuring the environmental, social, and governance aspects of the restoration activities are thoroughly maintained.



Investment options

Much information already exists on best practices in mangrove conservation, but it is not being picked up by the majority of practitioners. Since many public funds are at their capacity limit due to competing needs, there is scope for the private sector to fill this gap (Credit Suisse et al., 2014).^{xiii} Understanding the success factors of mangrove rehabilitation projects will assist the project developers, government, private sectors, and financiers (both not-for-profit and commercial) to:

- Increase technically relevant project knowledge and support capacity-building efforts
- Inform public and philanthropic grant making to be spent in a more targeted and effective way
- Develop projects meeting the needs of the impact investors and financial service institutions, including having an attractive risk-return profile for private sector engagement in mangrove restoration projects.

Investing in mangrove restoration requires analyses of the investor perspective in conservation finance, and attempts to bring together or link the demand side (i.e., the need for conservation funding) and the supply side (i.e., the availability of investments with conservation impact) through a deeper mutual understanding between investors and providers of conservation projects. The investor perspectives cover the issues of scalability, both of the investment vehicles or products being offered to financial markets and of the ecosystem-related cash flows into which funds are invested and that are often geographically and topically fragmented and mechanisms to ensure measurable and verifiable financial and conservation impacts.

Investment strategies

Depending on the objective and interest of business participation in mangrove restoration, there are five strategy options that businesses can take:

- a. **Direct engagement in mainstreaming mangrove restoration by investing in the improvement of the supply chain** throughout the production process would reduce pressure on mangroves and/or rehabilitate mangrove conditions to maintain the productivity of their sources (Investing in coastal aquaculture business transformation to sustainable aquaculture). This type of investment strategy is usually applied to fisheries industry, both for capture fisheries and aquaculture, as well as coastal tourism which provides lodging and relevant watersport and attractions.

Mangrove planting and maintenance embedded in infrastructure development objectives such as seafront housing, road infrastructure and 'green port' also prefer this type of investment as natural protections against weather and coastal elements and/or increase values by building green sceneries.

- b. **A company holder of PBPH in the coastal area - seeks a new stream of potentially more lucrative revenues for less pressure on the habitat**, at the same time contributing to climate change mitigation and adaptation. The business model is to include mangrove restoration (carbon capture and storage, eco-tourism, silvofisheries) within the allowable corridor of multi-use of the forest. (See the case illustration of PT KLAI)



Image: Unsplash.com

Business model transformation case

PT. Kandelia Alam (KLIA), a forestry concession previously obtained a permit in 2008 to produce wood chips and charcoal from the mangrove forest. In the last three years, PT. KLIA transformed its business model into mangrove coastal tourism and silvofisheries. To do this, PT. KLIA explores a blended finance solution as a vehicle to aggregate financing opportunities for forestry concession and allows concessionaires to work together on sustainable landscape development. Activities include sustainable mangrove forest management, ecosystem services, building biodiversity corridors, developing non-timber forest products, and promoting ecotourism in Kubu Raya, West Kalimantan Province.

Sources: <https://www.convergence.finance/design-funding/grant-portfolio/3UXeuYdFoj7JCJMfubBqIO/view>



Image: Shutterstock.com

- c. **Businesses invest by partnering with project developers** (other business entities, NGOs, CSO, or community groups) in a mangrove restoration project as part of gaining emission offset credit for the carbon market or as a measure to improve their ESG proposition including a more impactful CSR.
- d. **The Business invests in the CCMA project**, by working together with philanthropy, NGO, and the community in mangrove rehabilitation projects or development projects (tourism, wider coastal economy, incl. sustainable aquaculture) with a mitigation component. When the project generated carbon offset by demonstrating that emissions have been reduced or sequestered relative to a counterfactual baseline, revenues could be obtained from sales of emission reduction units.
- e. **Investment through establishing Ecosystem Restoration Forest Utilization business (PBPH-RE)**. Rehabilitation of mangroves in production forest areas is implemented as Forest Utilization Activities which should be carried out with Forest Utilization Business Permits or Social Forestry Management activities. Applicable for protection forest (HL), production forest (HP), and Conservation areas (HK) through a business model specific for ecosystem restoration with carbon sequestration and storage activities, utilization of ecosystem services, and/or multiple uses of forest resources.²³ (See the illustration of the REDD+ case in OKI).

²³ Business Activities in Protection Forest Areas, Article 130 of the Government Regulation Number 23/2021.

Case Study: REDD+ Project in OKI, South Sumatera

This REDD+ type of mangrove rehabilitation was initiated by Consortium between PT. Tiara Asia Permai (TAP) and YL Forest Co. Ltd (YLF). The consortium of PT. TAP and YLF obtained the business license in July 2013 and started the project in August 2016. The Environmental Services Business License - Protected Forest (Izin Usaha Jasa Lingkungan - Hutan Lindung (IUJL-HL)) for a REDD+ project is for 23,000 ha in the northeast of Ogan Komering Ilir (OKI) district for 30 years.

The project expects an initial investment of approximately US\$10,846,000 (for rehabilitation only). YLF expects that the entire portion of the investment will be in the form of equity. Since 6 January, TOKYO-Mitsui O.S.K. Lines, Ltd. (MOL) enter into agreement with YLF to provide a grant with possible equity financing subject to the REDD performance and the carbon price regulation in Indonesia.



Image: Unsplash.com

The OKI REDD+ project comprises two main activities, mangrove forest conservation and restoration and community development with sylvofisheries. The reforestation is carried out in 23,500 ha of permit area which has 65% of deforestation and degradation due to illegal logging and clearing for aquaculture ponds, firewood over-exploitation, forest fires, and changes in coastal hydrology.

The project aims to avoid the emission of about 5 million tons of CO₂ through mangrove forest conservation and to offset and store another 6 million tons of CO₂ through afforestation of 9,500ha of bare land with mangroves in the next three decades. The emission reduction registration is currently being processed by Verra.

Annual CO₂ sequestration attestable to groups of planted Mangrove trees comes to an average value of 29.8 tonCO₂/ha/yr, with CO₂ absorption volumes calculated for the 30-year duration of the project assessed at 6.4 million tCO₂ after being subtracted by uncertainty level of 30%. The project expects to sell its emission reduction credit through a voluntary market under the VCS Program.

Sources: <https://ylforest.co.jp/redd-plus/>

The 'Preliminary Stage' of investment

Early-stage mangrove restoration investment mechanisms will focus on how to help projects gain initial capital and set up their intervention or business models. Three mechanisms are proposed in the early stage: (i) development grant, (ii) grant-debt funding with market access, and (iii) guaranteed loans.

Development grant

The development grant mechanism is applicable on a relatively small scale with sources of funds from public funds and grants. The source of funds does not require financial returns. Financial support from the grantor is usually used for setting up project costs, including designing, initial project activities, and investment in community livelihood. The development grant is also used for a certain period of financing recurring costs or operational costs. This development grant type might only be a one-off restoration type, particularly in rehabilitating conservation areas without requiring community development.

For the community-based mangrove restoration, the success indicator of this type of investment is when the set objectives of the project related to mangrove restoration are performing well according to the agreed indicator of the project document, and the subsequent recurring cost could be financed from the revenues of carbon credit, mangrove NTFPs including fisheries commodity or both.

The role of project aid is mainly for providing technical assistance, capacity building, supervising project management, and monitoring. The project aids sometimes perform as project management unit who also supervise reporting and evaluation and preparing an exit strategy.

The critical factor of this investment type is that a) grant must be able to provide upfront capital for activities, and b) intermediaries (Project Aids) between project and Grantor could provide an extra layer of expertise and accountability. The potential sources of funds might include national and regional government budgets, development aid agencies, philanthropy foundations, CSR, etc. The average funding size is adaptable to the requirement. The successful grant type with community development could evolve into grant-debt funding with market access.

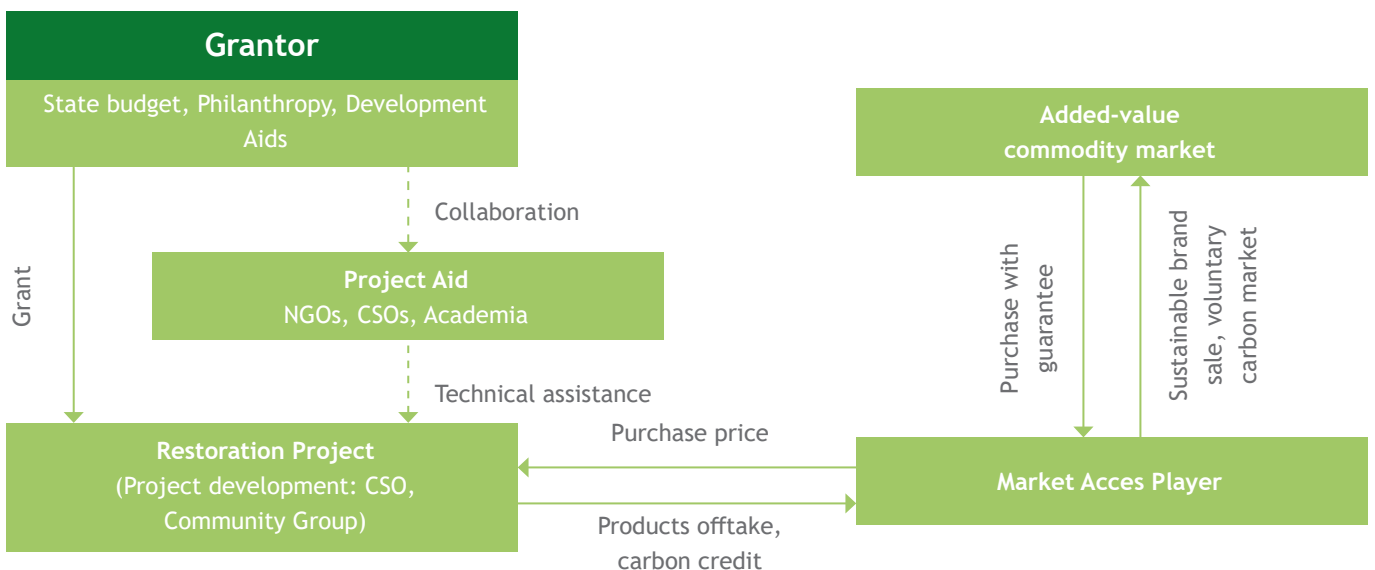


Figure 4. Development grant mechanism

Grant - debt funding with market access

For mangrove restoration projects in production forests, protection forests, and non-forest areas, the early stage of the business model could take the grant-loan funding with market access. This type of funding use grant as initial project setup and financial risk mitigation to attract debt financial from the concessional loan (improve benefit/cost analysis and economic rate of return).

The portion of initial capital shall be paid upfront by Grantor, as well as technical assistance or equipment necessary for setting up the intervention/business model. After setup, the project shall be able to generate revenue with the help of the Market Access Player. These players enable a seamless connection with Companies with environmental liabilities or those

wishing to off-take carbon, sustainable commodities, and/or other environmental services. Concessionary Investors provide another portion of initial capital and a portion of the Project’s recurring costs until the Project is self-sustainable. The average funding size in total is in the area of USD 500,000 - USD 5 million, with a grant component of up to 50%, and should the project be successful, the project could evolve into guaranteed loans.

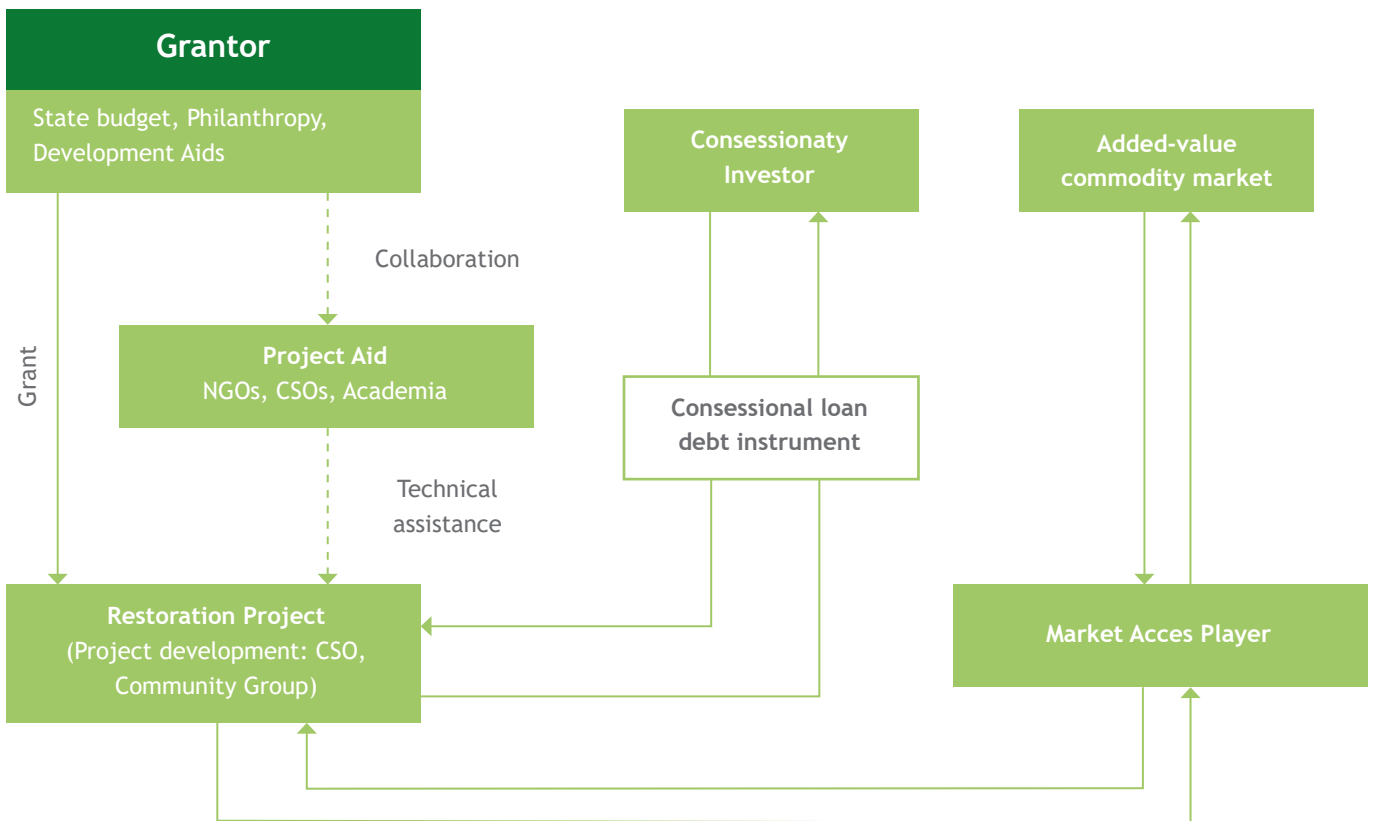


Figure 5. Grant-debt mechanism with market access

Guaranteed loans

Ecological based restoration project sometimes requires a landscape approach with a size of area and scale of investment larger than a grant type financing could provide. When the project could identify results that would have marketable values such as mangrove product commodities and/or carbon credit, it can seek financial resources by lending financial services with a lowered interest rate for environmental and social benefits (concessionary investors).

Grantor provides the first-loss mechanism by providing a guarantee that investors are to be paid a certain rate of return. Any deviation under the guaranteed return shall be paid by the grantor. Concessionary investors provide the initial upfront capital to Projects, as well as a portion of initial recurring costs. Public/private companies make commitments based on results or performance achieved by Projects. This performance shall be agreed upon contractually before Project inception, e.g., hydrological improvement, construction planting protection, and incubator business development.

Potential Sources of funds for grantors include the non-required return category from development aids and philanthropic grants, and concessionary investors are depending on specific project criteria. The financial instruments are grants or guarantees, and loans, and the source of revenues are sales of commodities and if applicable verified emission reduction or ecosystem services while the revenue instrument is a Payment Contract.

The critical issues of this type are a) debt instrument with concessional interest rate and grace period until repayment, b) credit guarantee and first loss mechanism to address investor’s risk, and c) loans may be available for drawdown upfront and/or revolving according to cash flow needs.

Examples of existing vehicles or ongoing agreements are including Mirova - Althelia Climate Fund;²⁴ ADM Capital - TLFF; World Bank - Partnership for Market Readiness (PMR), BioCarbon Fund, USAID - Development Credit Authority (DCA), as credit guarantee; IDH - &Green Fund as credit guarantee.

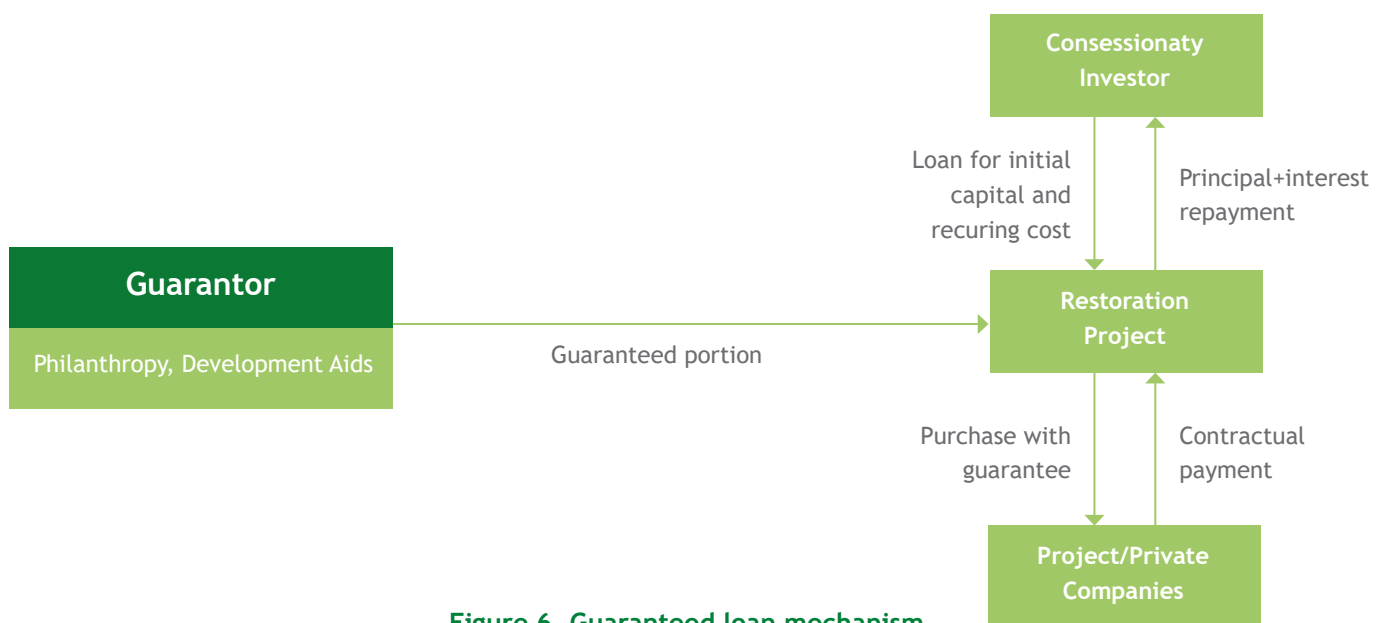


Figure 6. Guaranteed loan mechanism

²⁴ Mirova, an affiliate of Natixis Investment Managers specializing in sustainable investment, has finalized its acquisition of 100% of Mirova Natural Capital1 (formerly Althelia Ecosphere). <https://www.im.natixis.com/en-institutional/news/mirova-has-finalized-its-acquisition-of-mirova-natural-capital>

Transition-stage mechanism

This transition stage mechanism focuses on growing and scaling proven business models. For this stage, a more conventional approach to structured project financing is still being utilized. Most of the activities will involve the aggregation of the initial investments into a larger fund vehicle. In the meantime, recurring costs for intervention that could not be covered by business revenue shall still be financed by grant funding.

The critical element for the mid-stage mechanism is:

- Upfront loan for business transformation set against repayment through commodity sales
- De-risking element through linkage with donor funding or low interest government backed public service agency’s lending for cooperative, medium-mini-micro enterprises

- De-risking through the demand-side guarantee in the form of pre-purchase contracts or market access assistance
- Additional revenue guarantee and community-purpose incentive through sale or pay-for-performance contract for ecosystem services

The conventional approaches of grant and regulator support are required to attract commercial investors. At this stage when some of the economic activities should be conducted through a business model, not just subsistence level, incubation financing is required to support the establishment of medium-mini or micro enterprises. The role of BUMDES (village-own enterprise) and Public Financial Service Agency (BLU) such as Revolving Fund Management Institution for Cooperative, Micro, Small and Medium Enterprises (Lembaga Pengelola Dana Bergulir Koperasi, Usaha Mikro, Kecil dan Menengah, LPDB-KUMKM) and Marine and Fisheries Business Capital Management Institution (Lembaga Pengelola Modal Usaha Kelautan dan Perikanan/LPMUKP) are strategic.

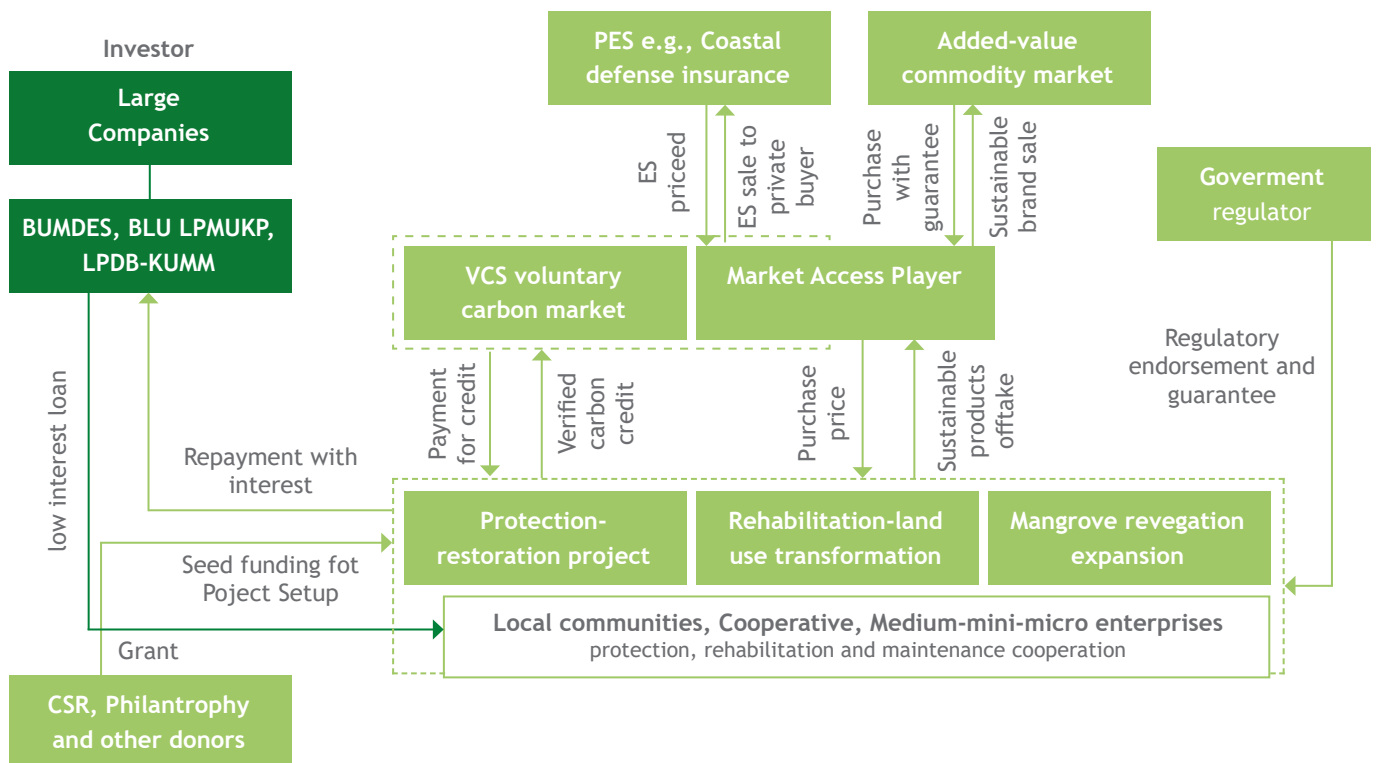


Figure 7. Transition stage mechanism with multiple types of financial sources and products

The advance stage – scale up with various funding sources and revenue streams

Mangrove restoration and related climate objectives could benefit from effective allocation of capital. Effective allocation of capital provides a mechanism which connects buyers and suppliers through a platform with lucidity over prices and quantity of goods sold. A good market mechanism would address three issues on today’s emission transactions, i.e., limited supply of tradable emissions (the “product”), lack of visibility on actual demand size as commitments usually do not

state demand number, and lack of “supply and demand bridge” as most transactions are done over the counter.

Figure 8 below, is an illustration of a recommendation for investment mechanism with varieties of project types, funding sources and their instruments, as well as revenue sources and their instruments. A Special Purpose Vehicle (SPV) has an important role to bring financing from investors and donors to the projects. At the same time, the SPV will connect goods produced from projects to the market. The revenue generated is proceeded back to the projects and distributed for repayment accordingly, both are also done by the SPV.

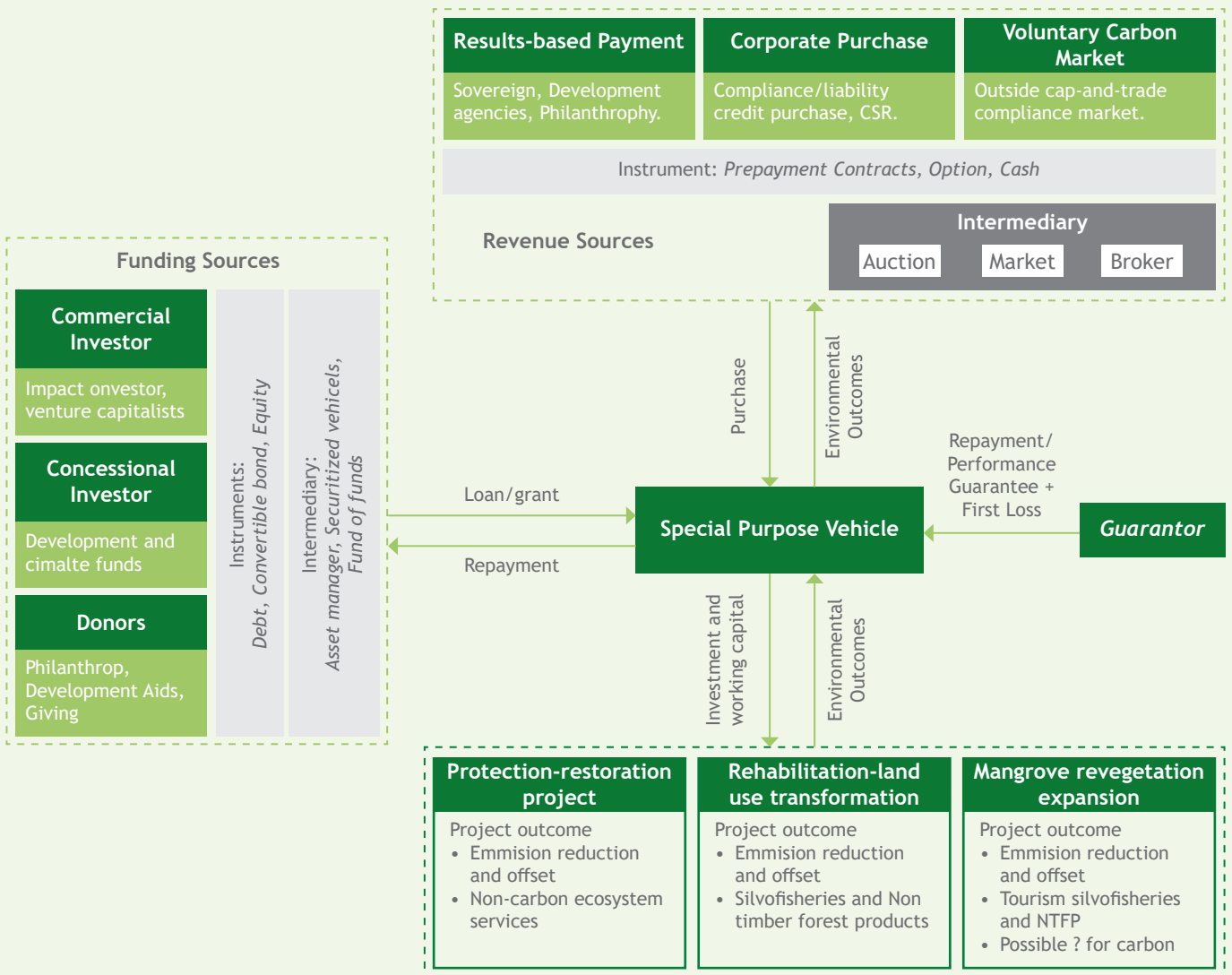


Figure 8. Financial mechanism of an advance investment for mangrove restoration



Image: Freepik.com

Special purpose vehicles

An SPV has an important role to bring financing from investors and donors to the projects, and it will connect goods produced from projects to the market. Revenue generated will be proceeded back to projects and distributed for repayments by the SPV. The finance allocation scheme, or mechanism, must be innovative and flexible. One option is blended finance, which requires the creation of an SPV. The SPV will act as an intermediary between on-the-ground projects and funding/revenue sources. The creation of an SPV is essential to ensure credibility and effective usage of funding. Funding sources can be commercial and concessional investors as well as donors. Loans from them can be pooled and allocated to projects with this mechanism. The SPV is also needed to validate the environmental outcomes of restoration projects.

In the case of the transformation of the business model, the SPV will act as a “secretariat” to allocate funds to project companies from donors and investors. The same occurs for mangrove expansion with commodities businesses, where an SPV is essential to run the mechanism. However, the identification of a market access players is essential for commodities. Market access player will connect projects with the commodities market. In addition, it will guarantee buyers sustainable guaranteed products.

For the protection-restoration type of project, SPV will enable payment-for-performance from donors and transactions from the market. For rehabilitation - land use transformation type of project, SPV will enable payment-for-performance from donors and aggregate concessional funds. For mangrove expansion - sustainable commodities type of project, SPV will enable market entrance and ensure a “sustainability” guarantee for buyers.

The Main feature of this mechanism

Main revenue comes from results-based payment (RBP) sponsored by both external and governmental commitments. A debt instrument is issued against RBP commitment with resources used for project setup and operations coming from loan proceeds. Experienced carbon project developer should be involved to assess and establish a strategy for de-risking on operations and emission reduction units’ delivery.

To secure high quality emission reduction units from leakage, de-risking on carbon unit integrity by involving local government on emission reduction verification and accounting, and de-risking on societal effect by cooperation with local communities, assisted by market access players to provide livelihood through sustainable commodity production.

Financial resource for investment

Large-scale mangrove restoration requires significant financial resources from public and private sector. However, allocation of public funding and private investment towards mangrove are often hindered by issues and uncertainties on regulation and market. Hence, non-financial investments, such as lobbying and influencing for regulatory push and mangrove agenda prioritization, are essential to open a path towards large-scale allocation of capital. Various financial instruments can be applied for project-level financing according to its maturity.

Figure 9 illustrates the risk spectrum and financing types through stages of business maturity and the followings describe the financial type. And several critical factors and key decisions must be taken in order to decide which mechanism is the most suitable. There are increasing opportunities for mangrove rehabilitation related to sustainable tourism, food production, sustainable coastal infrastructure and climate financing. However, securing these opportunities requires large investments, and blending resources from governments, donors and private sector need to be consolidated.

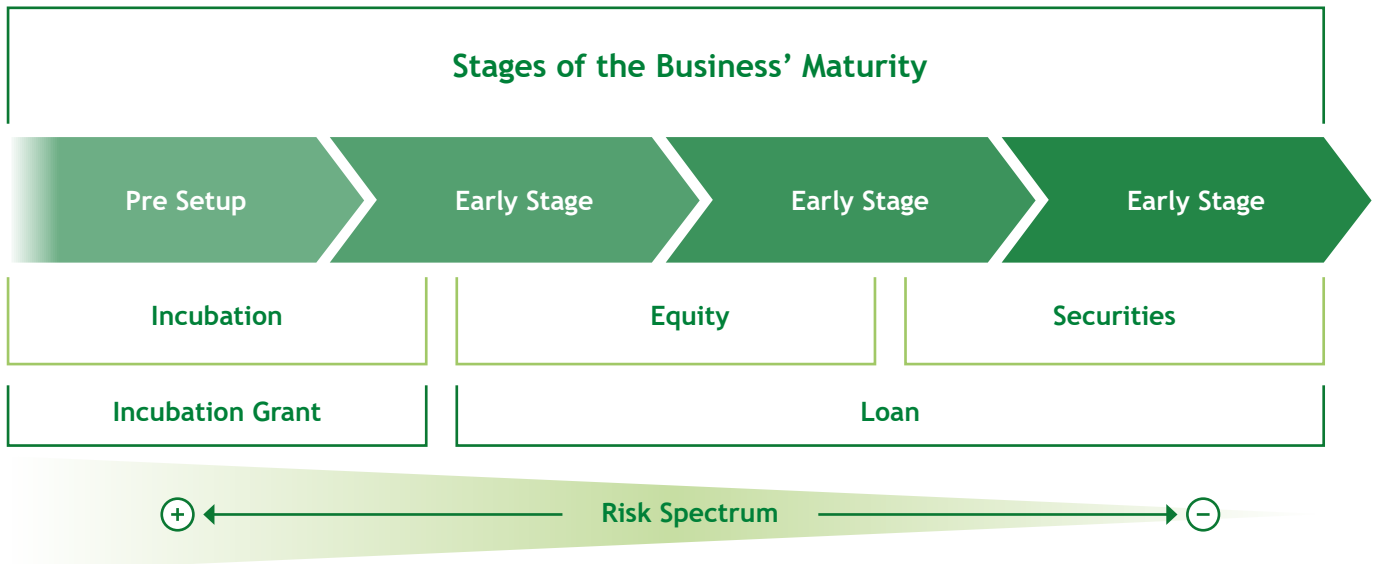


Figure 9. Risk spectrum of business' maturity stages

Non-commercial public investment

State budget

The debate about the adequacy of state spending on environmental management and restoration has heightened in recent years, in light of recent economic realities. Environmental issues and the protection of natural resources are part of the public service obligation to support people's welfare. The primary role of the state budget in restoring mangroves is for financing non-economic but significant intervention, for instance the restoration of protected areas, the first part of the investment that does not generate an economic return or high-risk for commercial investment, etc. The state budget is also key to linking development spending for fisheries, rural development, infrastructure, and the relevant development sector to mangroves protection and rehabilitation.

Indonesia's state budget allocated for mangrove rehabilitation in 2020 was IDR 421.9 billion. The budget is mostly allocated for labour-intensive mangrove planting by the community and/or community groups around the degraded coastal areas and in small part is used for ponds water management. In 2021 state budget allocation is increased almost four folds to IDR 1,589 billion.

Sovereign loan

The project loan finances a stand-alone investment with a defined scope and tangible outputs. It provides direct financial assistance to sovereign projects. The project loan is simple, upfront, and clear. What the loan will be financing is known and fully appraised before approval. Lenders is involved in safeguards assessments and plans.



Image: Unsplash.com

Indonesia – World Bank collaboration: Mangrove for Coastal Resilience Project

To support Indonesia's commitment to rehabilitate 600,000 hectares of mangrove, the Government of Indonesia collaborates with the World Bank through a project "Mangroves for Coastal Resilience Project" that contain a significant portion of existing and degraded mangroves areas. This project will be financed through Investment Project Financing (IPF) with Performance-Based Conditions (PBCs). The project aims for significant positive environmental impacts by rehabilitation of 75,000 ha and by building capacity for these activities at the national and sub-national levels. The integrated conservation, rehabilitation, and livelihood improvement model can be replicated throughout the country and promote the conservation of existing 400,000 ha of mangroves (The World Bank Press Release 7 June 2022).

Sources: The World Bank. Project Information Document (PID) Indonesia Mangroves for Coastal Resilience Project (P178009).

Philanthropy and development partners grants

Grants from philanthropy and development partners are beneficial for setting up initial interventions without promise of financial returns, such as for project preparation, technical assistance, feasibility study for restoration at scale, social and livelihood security measures, etc. Therefore, a good balance of grant dependence shall be considered in structuring a long-term sustainable financing platform. The role of philanthropy and development partners grants is also on leveraging other financial resources by de-risking operational and social risks and providing reputational assurance for corporates to invest.

Incubation grants

Incubation funding provides a way to help entrepreneurs, potential developers, and/or government partners in setting up their alternative business and management models, with non-financial assistance and without the pressure of high required returns.

Incubation grants are intended for pre-setup for businesses; early stage of business operations stage(s). The risk spectrum is high with a possible return profile being low or even none. The fund usage is for feasibility study, core team hire, land, production trial, and licensing.

Financial resource link to development investment

There are increasing opportunities in sustainable tourism, food production, wastewater treatment, integrated solid waste management, and sustainable coastal infrastructure, but securing these opportunities requires large investments, and governments and donors cannot meet the needs alone (ADB-ACGF, 2021).

The funding gap can only be met by significant ramp-up in flows from commercial and institutional finance, capital markets, and public-private partnerships. Traditional blended finance vehicles play a crucial role in increasing blue economy investments from non-sovereign sources, but more innovative structures like blue bonds, debt-for-nature swaps, credit enhancements, SDG bonds, and other innovative approaches to tapping the region's capital markets should be explored to suit the needs of specific projects (ADB-ACGF, 2021).

Payment for ecosystem services (PES) for mangroves

Payments for Ecosystem Services are the variety of arrangements through which the beneficiaries of environmental services, from watershed protection, and coastal resilience to carbon sequestration and nature attractions, make payment to entities maintaining these services with subsidies or market payments (Salzman et al, 2018). PES for climate change mitigation and adaptation (CCMA) usually in the form of result-based payment mostly comes from REDD+ type of projects. The forest carbon market has received the most attention of any PES sector because of the high interest in climate change. The sector has been volatile and the growth potential will depend largely on how countries implement the Paris Agreement on climate change.

From a business perspective, to increase the interest in investment for conservation projects are (i) the monetary and conservation benefits of conservation programs should be sufficiently identified or standardized; (ii) the government or financial regulator establish regulatory intervention in pursuing environmental benefits does not run contra-productive with other investment the investors involved; and (iii) conservation projects should set up with the same focus on return/impact maximization and replication as are traditional business models.

Commercial type of financial resources

Bonds and loan capital

Companies operating alternative business and management models would require top-up investment for working capital and/or capital expenditures. A relatively available and speedy means of funding is through lending instruments. Loans could either be sourced through simple lending agreements, bond issuance, or other structured lending instruments. Two critical factors that would decide which structure fits best are the difficulty of risk-return matching between borrowers and lenders and the certainty in sources of loan repayment. These two factors are considered on the more challenging spectrum due to alternative business models' largely unproven success. Therefore, the involvement of risk capital, such as first-loss absorption, insurance, and other trustworthy guarantees would significantly increase investor's appetite in providing loans through these instruments.

An example of an available construct for this investment is the Green Sukuk issued by the Indonesia Ministry of Finance (MOF). In this case, a sovereign entity issuer significantly guarantees the certainty of repayment of the lending instrument. Ideally, such an instrument issued for mangrove financing would have a similar level of assurance, either by having a sovereign issuer or guarantor. This financial source is intended for early stage, scale, and optimization with a risk profile of mid to low and a return profile is low to mid. The fund usage is usually for land & licensing, CAPEX, working capital, follow on capital expenditures, scale up capital.

Equity capital

The degree of involvement in equity investment would mean the investor has a direct stake in the project's ownership and success. This implies a relatively higher risk than loan capital but also a higher potential return. Pathways for equity investment - in order of project's maturity - could be through (1) participating in the project's initial capital injection, (2) subsequent equity fundraising, or (3) buying the project's shares through capital market.

This financial source is intended for the early and scale up stage with a risk profile of mid and a return profile is mid to high. The fund usage is usually for working capital, followed by capital expenditures, and scale-up capital. An example of an available construct for this stage is the direct equity investment by impact funds such as Althelia (now become part of Mirova) into ecosystem restoration companies in Indonesia.

Securization

This investment format is intended to allow projects sustained access to liquidity through the capital market. By securitization of the project's cash flow or assets, the company can raise needed capital at any given time without the costly and lengthy procedures of loan origination or fund-raising. This instrument would require a cash-flow/value-generating asset to be assigned as the underlying of a security trading unit. This financial source is intended for a more mature stage, business optimization with a risk profile of mid to low and a return profile is mid to high. The fund usage is usually for working capital, followed by capital expenditures.

An example of an available construct for this investment format is the OJK-regulated Asset-Backed Security (EBA). If assets such as carbon units could be assigned with agreeable valuations, the asset can subsequently be pledged to a unit of security. Conceptually, the security has value because it is tied to the monetization of the carbon asset, i.e., cash flow from carbon sales is pledged to the holder of the security. This unit of security is then traded in the capital market with its value according to supply and demand forces.

Proceeds from the initial sale of unit security will be used by the security issuer, which in this case, is the project company. Subsequent trading of unit security in the capital market and profits made from buy-sale margins would be to the benefit of the traders.

Key takeaways

- **Incubation provides a way to help entrepreneurs, potential developers, and/or government partners** in setting up their alternative business and management models, with non-financial assistance and without the pressure of high required returns.
- **Bond/loans provide relatively available and speedy means of funding for top-up investment for working capital and/or capital expenditures.** Loans could either be sourced through a simple lending agreement, bond issuance, or other structured lending instruments. Two critical factors that would decide which structure fits best are the difficulty of risk-return matching between borrowers and lenders and certainty in sources of loan repayment.

These two factors are considered on the more challenging spectrum due to alternative business models' largely unproven success.

Therefore, the involvement of risk capital, such as first-loss absorption, insurance, and other trustworthy guarantees would significantly increase investor's appetite for providing loans through these instruments.

- **Equity leads to a more direct stake in project ownership and success by investors**, implying higher risk than a loan but higher potential returns. Pathways for equity investment - in order of project's maturity - could be through 1) participating in the project's initial capital injection, (2) subsequent equity fund-raising, or (3) buying the project's shares through capital market. Securitization is intended to allow projects sustained access to liquidity through the capital market.
- **By securitization of the project's cash flow or assets, the company can raise needed capital at any given time** without the costly and lengthy procedures of loan origination or fund-raising. This instrument would require a cash-flow/value generating asset to be assigned as the underlying of a security trading unit.

Conclusion and Recommendation

Conclusion

01



Mangroves investment requires robust planning and management steps. These steps require significant capital over the long-term, therefore long-term solutions for mangrove management must incorporate emission reduction finance, effectively necessitating the need for emission transfer to ensure large-scale capital allocation. Current emission transfer mechanisms are still evolving and require many adjustments for the Indonesian context.

02



Government has a key role in providing regulatory push and establishing streamlined and flexible yet robust procedures to reduce if not eliminate uncertainties on land use regulation and the market for ecosystem goods and services, that are required by donors and philanthropic entities, businesses and investors to participate in mangrove restoration.

03



The advantage of scaling up mangrove restoration through private financial institutions is their leverage to push for faster changes in the restoration results through engagement and capital allocation. This trend is expected to strengthen as the new generations of investors, increasingly aware of the environment, social, and governance (ESG) issues, seek investments aligned with their values. Equally, the project itself would profit from the same rigorous approach to project diligence, selection, and feasibility assessment, as done in standard portfolio management.

04



Scaling up rehabilitation finance poses significant challenges, for both the rehabilitation project and the financing side. However, it also represents a major private sector investment opportunity that so far is not fully developed and represents a rare opportunity - and obligation - for the NGO community and the philanthropic communities as well as the financial services industry to work closely with each other, each bringing their specific skills to bear.

Recommendation

- ☆ Three main types of mangrove restoration models are proposed considering the different land use allocations, habitat conditions, and potential area for mangrove rehabilitation, i.e., protection - restoration model, rehabilitation - land management transformation model, and potential area revegetation. Investors could target priority areas where investable conservation asset classes yield the biggest potential restoration impact and where restoration projects have a chance to offer viable investment returns given the prevailing regulatory and political environment.
- ☆ Non-financial investments, such as lobbying and influencing for regulatory push and peatland agenda prioritization, are essential to open a path towards large-scale allocation of capital.
- ☆ While the required regulation for carbon pricing is still developing, the mangrove restoration projects should be established in stages, even though proper piloting. Starting from restoration investment that focuses on how to help projects gain initial capital and further scale up their intervention or business to sustainable and economically viable models.
- ☆ With financial support from donors and philanthropy, as well as from their own fundraising, NGOs should aim to provide a sufficient supply of largescale rehabilitation projects that have clearly defined environmental and financial benefits and local regulatory backing:

 - They can act as verifiers of rehabilitation project impact, which investors will value as a ‘seal of approval for their investments;
 - They can also work to further develop rehabilitation impact measurement techniques, allowing to further standardize the practice and other organizations to engage in such certification; and
 - They can also act as facilitators of large-scale conservation programs by using their skills in working with governments, financial institutions, and the community.
 - Through their fundraising and philanthropic foundation, provide early-stage finance to build trust among the parties.
- ☆ The finance community has the opportunity to develop rehabilitation products and distribute them to its clients:

 - Asset and fund managers can structure wealth-preserving rehabilitation products for high and ultra-high net worth individual segments - a largely unexplored opportunity - and look at return-generating conservation products alongside more traditional alternative investments;
 - the projects or portfolio companies into which such structures will invest would benefit from professionalization driven by the process of project selection, due diligence, and portfolio management as applied in other areas of investment; and
 - private banks and asset managers could make conservation finance part of their standard advisory services, much like philanthropy, impact investing more broadly and alternative investments are today.

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