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Report No.: PAD4757

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US$400 MILLION

TO THE

REPUBLIC OF INDONESIA

FOR A

MANGROVES FOR COASTAL RESILIENCE PROJECT

May 2, 2022

Environment, Natural Resources & The Blue Economy Global Practice
East Asia And Pacific Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective March 1, 2022)

Currency Unit = Indonesian Rupiah (IDR)

US$1 = IDR 14,350

FISCAL YEAR
January 1 – December 31

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ABBREVIATIONS AND ACRONYMS

AD	Avoided deforestation
AFOLU	Agriculture, Forestry and Other Land Use
ARR	Afforestation, reforestation and revegetation
BPDASHL	Center for Watershed Management and Forest Protection, *Badan Pengelola Daerah Aliran Sungai dan Hutan Lindung*
BPK	Supreme Audit Institution, *Badan Pemeriksa Keuangan*
BRGM	Peatland and Mangrove Restoration Agency, *Badan Restorasi Gambut dan Rehabilitasi Mangrove*
CCAP	Climate Change Action Plan
CCDR	Climate Change Development Report
CDD	Community-driven Development
CMMIA	Coordinating Ministry of Maritime Affairs and Investments
COVID-19	Coronavirus disease 2019
CPF	Country Partnership Framework
CSO	Civil society organization
DA	Designated Account
DG	Directorate General
DMPM	Mangrove Stewardship Village, *Desa Mandiri Peduli Mangrove*
ESMF	Environmental and Social Management Framework
FMA	Financial Management Assessment
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GoI	Government of Indonesia
GRID	Green, Resilient, and Inclusive Development
GRS	Grievance Redress Service
KKMD	Provincial-level Mangrove Rehabilitation Teams, *Kelompok Kerja Mangrove Daerah*
IBRD	International Bank for Reconstruction and Development
ICB	International Competitive Bidding
ICT	information and communication technology
IEF	Indonesian Environment Fund
IFR	Interim Financial Report
IPF	Investment Project Financing
IVA	Independent Verification Agency
LKPP	National Public Procurement Agency, *Lembaga Kebijakan Pengadaan Barang/Jasa Pemerintah*
M4CR	Mangroves for Coastal Resilience Project
M&E	Monitoring and Evaluation
MDTF	Multi-Donor Trust Fund
MMAF	Ministry of Maritime Affairs and Fisheries
MoEF	Ministry of Environment and Forestry

MoF	Ministry of Finance
MRV	Measurement, Reporting and Verification
NBSAP	National Biodiversity Strategy and Action Plan
NDC	Nationally Determined Contribution
NGO	Non-governmental Organization
NPV	Net Present Value
NSC	National Steering Committee
OM	Operations Manual
PBCs	Performance-Based Conditions
PDASRH	Watershed Management and Forest Rehabilitation, *Pengelolaan Daerah Aliran Sungai dan Rehabilitasi Lahan*
PDO	Project Development Objective
PEN	COVID-19 Recovery Program, *Program Pemulihan Ekonomi Nasional*
Perda/Pergub/Perbup	Subnational regulations (*Peraturan Daerah, Peraturan Gubernur, Peraturan Bupati)*
PIU	Project Implementation Unit
PKPD	Inland Water Damage Control, *Pengendalian Kerusakan Perairan Darat*
PMC	Project Management Consultant
PMK	Minister of Finance Regulation, *Peraturan Menteri Keuangan*
PMN	National Mangrove Map, *Peta Mangrove National*
PMO	Project Management Office
POKJA KKMN	National Mangrove Working Group, *Kelompok Kerja Mangrove Nasional*
PP	Procurement Plan
PPIUs	Provincial Project Implementation Units
PPSD	Project Procurement Strategy for Development
QCBS	Quality- and Cost-Based Selection
RKUN	State Treasury, *Rekening Kas Umum Negara*
RTRW	Provincial or District Spatial Plans, *Rencana Tata Ruang Wilayah*
SLM	Sustainable Landscape Management
SLMP	Sustainable Landscape Management Program
SORT	Systemic Operations Risk-Rating Tool
SPSE	Government's Electronic Procurement System, *Sistem Pengadaan Secara Elektronik*
STEP	Systematic Tracking of Exchanges in Procurement
tCO_2	tons of carbon dioxide
TOR	Terms of Reference
TOT	Training of Trainers
TT	Technical Team, *Tim Teknis*
TZ	Time Zero
UPT	Provincial Representation Office, *Unit Pelaksana Teknis*
USAID	United States Agency for International Development

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DATASHEET

BASIC INFORMATION

Country(ies)	Project Name	
Indonesia	Mangroves for Coastal Resilience Project	
Project ID	**Financing Instrument**	**Environmental and Social Risk Classification**
P178009	Investment Project Financing	Substantial

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach (MPA)	[ ] Contingent Emergency Response Component (CERC)
[ ] Series of Projects (SOP)	[ ] Fragile State(s)
[✓] Performance-Based Conditions (PBCs)	[ ] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made Disaster
[ ] Alternate Procurement Arrangements (APA)	[ ] Hands-on Enhanced Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date
20-May-2022	30-Apr-2027

Bank/IFC Collaboration

No

Proposed Development Objective(s)

To enhance the management of mangroves and livelihoods of local communities in selected areas

Components

Component Name	Cost (US$, millions)
Component 1. Strengthening Policy and Institutions for Mangrove Management	19.00

Component 2. Rehabilitating and Promoting Sustainable Mangrove Management	300.00
Component 3. Improving Livelihood Opportunities for Mangrove Communities	80.00
Component 4. Operation Management	20.00

Organizations

Borrower:	Republic of Indonesia
Implementing Agency:	Ministry of Environment and Forestry Peatland and Mangrove Restoration Agency Indonesian Environment Fund (IEF) Coordinating Ministry of Maritime and Investment Affairs

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	419.00
Total Financing	415.00
of which IBRD/IDA	400.00
Financing Gap	4.00

DETAILS

World Bank Group Financing

International Bank for Reconstruction and Development (IBRD)	400.00

Non-World Bank Group Financing

Trust Funds	15.00
Sustainable Landscapes MDTF	15.00

Expected Disbursements (in US$, Millions)

WB Fiscal Year	2022	2023	2024	2025	2026	2027
Annual	0.00	56.30	146.20	123.80	44.90	28.80

Cumulative	0.00	56.30	202.50	326.30	371.20	400.00

INSTITUTIONAL DATA

Practice Area (Lead)

Environment, Natural Resources & the Blue Economy

Contributing Practice Areas

Finance, Competitiveness and Innovation, Social Sustainability and Inclusion

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	Moderate
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	Substantial
4. Technical Design of Project or Program	Substantial
5. Institutional Capacity for Implementation and Sustainability	High
6. Fiduciary	Substantial
7. Environment and Social	Substantial
8. Stakeholders	Substantial
9. Other	
10. Overall	Substantial

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
Assessment and Management of Environmental and Social Risks and Impacts	Relevant
Stakeholder Engagement and Information Disclosure	Relevant
Labor and Working Conditions	Relevant
Resource Efficiency and Pollution Prevention and Management	Relevant
Community Health and Safety	Relevant
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Relevant
Cultural Heritage	Relevant
Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

Legal Covenants

Sections and Description

The Borrower, through the Ministry of Environment and Forestry ("MoEF"), shall be responsible for the overall management and implementation responsibilities of the Operation, including, inter alia, the responsibility to cause the BRGM to cooperate and assist MoEF on all aspects of Operation implementation, in accordance with the provisions of this Agreement and the Operations Manual.

Sections and Description

The Borrower shall maintain, throughout the Operation implementation period, a national steering committee ("National Steering Committee") with attributions and composition acceptable to the Bank, which shall be: (a) chaired by the CMMIA, and composed of officials from the Borrower's line ministries set forth in the Operations Manual; and (b) responsible for facilitating inter-ministerial coordination and providing oversight and strategic guidance on the development/preparation and implementation of the Operation.

Sections and Description

Within three (3) months of the Effective Date, the Borrower shall establish and maintain, throughout the Operation implementation period: (a) a Project Management Office within MoEF; (b) Project Implementation Units within: (i) MoEF; (ii) until the expiration of its statutory mandate, BRGM; (c) the Borrower, through MoEF, shall ensure that upon the statutory expiration of the BRGM's mandate, the responsibilities of the BRGM PIU are duly transferred to the MoEF PIU. To that effect, the Borrower shall, within 12 months of the Effective Date: (i) adopt an Exit Strategy; and (ii) enact necessary procedures and regulations, in a form and substance satisfactory to the Bank, all to ensure MoEF PIU's effective and continuous implementation of the activities under Parts 2 and 3 of this Operation;(d) Provincial Project Implementation Units within each Target Province to support the implementation of rehabilitation activities, in coordination with the BRGM PIU.

Sections and Description

The Borrower shall: (i) make the necessary budget allocations for IEF; (ii) and issue the necessary regulations and instructions,under terms and conditions approved by the Bank, directing the disbursement of such budget allocations from the IEF to the MoEF, BRGM and their respective PMO, PIUs and provincial PIUs, to enable the entities to carry out their obligations under this Agreement and the Operations Manual, all in accordance with the approved Annual Work Plan and Budget.

Sections and Description

For purposes of carrying out Part 3.2 of the Operation, the Borrower shall cause the BRGM (and, upon the expiration of its statutory mandate, the MoEF) to: (a) form a selection committee, with terms of reference specified in the Operations Manual and with the composition acceptable to the Bank; (b) provide Coastal Enterprise Development Matching Grants to Benefitting Entities in accordance with terms and conditions, eligibility criteria and procedures set forth in the Operations Manual; (c) ensure that each Coastal Enterprise Development Matching Grant does not exceed the ceiling amount specified in the Operations Manual, and that the Benefitting Entity provide the necessary level of contribution, at the level specified in the Operations Manual; (d) ensure that each Coastal Enterprise Development Matching Grant supports activities deemed to be eligible under the Operations Manual and does not finance any activity if it belongs to the negative list of activities or sectors of activity deemed ineligible for support under the Operation and specified in the ESCP and Operations Manual.

Sections and Description

Prior to the Borrower providing a Coastal Enterprise Development Matching Grant under Part 3.2 of the Operation to a Benefitting Entity, the Borrower shall cause the BRGM (and, upon the expiration of its statutory mandate, the MoEF) to enter into a Sub-Grant Agreement with each Benefitting Entity, reflecting the terms and conditions approved by the Bank, which shall be consistent with the requirements of the Operations Manual.

Sections and Description

Within sixty (60) days of the Effective Date, the Borrower, through MoEF, shall adopt the Operations Manual and

thereafter, ensure that the Operation is carried out in accordance with the arrangements and procedures set out in the Operations Manual

Sections and Description

The Borrower shall cause BRGM (and, upon the expiration of its statutory mandate, the MoEF) to: (a) carry out its obligations and exercise its rights under each Sub-Grant Agreement, in such a manner as to protect the interests of the Borrower and the Bank and to accomplish the purposes of the Coastal Enterprise Development Matching Grant; (b) not to assign, amend, abrogate or waive the Operations Manual or any provision thereof, without prior approval of the Bank.

Sections and Description

By no later than three (3) months after the Effective Date, the Borrower, through the MoEF, shall appoint a Verification Agent to undertake the independent verification process referred to in paragraph 2 below in respect of PBCs 1-4, in accordance with the terms of reference acceptable to the Bank.

Conditions

Type	Financing source	Description
Effectiveness	Trust Funds	The Loan Agreement has been signed by the parties thereto and is effective.
Type	Financing source	Description
Effectiveness	IBRD/IDA	The Borrower, through its Ministry of Finance, has issued a Minister of Finance regulation, satisfactory to the Bank, designating the Indonesian Environment Fund (“IEF”) to be responsible for holding and administering the proceeds of the Loan.

I. STRATEGIC CONTEXT

A. Country Context

1. After two decades of political and institutional reforms, Indonesia is a stable democracy that has significantly reduced poverty. It is the world's fourth most populous nation, with 270 million people (2019) living on an archipelago of more than 6,000 inhabited islands. It is the world's 10th-largest economy, with a gross domestic product (GDP) of over US$1 trillion (2018), and the only Southeast Asian member of the G20. Between 2015 and 2019, Indonesia maintained an average real GDP growth rate of 5 percent. Indonesia dramatically reduced its poverty rate, from 24 percent in 1998 to less than 10 percent in 2019. The income of the bottom 40 percent rose, although the pace of reduction has slowed in recent years. GDP per capita rose steadily between 2000 and 2017, from US$857 to US$3,847, and the country's growing middle-class reached about 115 million people.[1] Growth fell sharply to 2.1 percent in 2020 following the onset of the global COVID-19 pandemic. In 2021, the economy rebounded with growth registering 3.7 percent on the back of public consumption and exports due to higher commodity prices. Growth is projected to accelerate and reach 4.9 percent in 2022 and 5.2 percent in 2023 as private consumption and investments pick up.[2]

2. Indonesia holds critical natural resources of significant global and domestic importance. Its vast forests, marine resources, and agricultural products provide crucial ecosystem and agro-ecosystem goods and services. The country is home to 10 percent of the world's tropical rainforests, 20 percent of its mangroves, and 36 percent of its tropical peatlands (which store roughly 28 billion tons of carbon).[3] Indonesia's 120 million hectares of forests are among the world's most diverse and productive. Its marine and fisheries subsector is of crucial importance to the 60 million people living near the coast.

3. A large part of Indonesia's economy continues to be driven by unsustainable exploitation of natural resources, which undermines the country's stock of natural capital. Renewable natural resources such as agriculture, forestry, and fish accounted for 12.7 percent of GDP in 2019 and two-thirds of exports.[4] Growth remains closely tied to the prices of Indonesia's key export commodities, including palm oil, pulp and paper, timber, and rubber. In the next 25 years, Indonesia is projected to experience lower land productivity, increased scarcity of renewable natural resource goods and services, and more severe impacts of climate change.[5]

4. Coastal communities are among the most vulnerable in Indonesia. Their poverty rates are higher than the national average, and they face multiple threats to their livelihoods. The poverty rate in coastal villages is 1.27 percent higher than in non-coastal villages, with the average fisher earning less than the minimum wage.[6] Coastal communities have limited access to services such as secondary schools, safe water, electricity, and transportation. The 2.5 million households involved in small-scale fisheries are characterized by high poverty rates (one-fifth of Indonesia's poor come from fishing households) and vulnerability, partly because of declining ecosystem health and climate change.[7] Poverty rates are likely to increase because of the economic downturn caused by the extended COVID-19 crisis.[8] Targeted policies and investments are needed to reach coastal communities that depend on natural resources and are vulnerable to

[1] World Bank 2018.
[2] World Bank, Macro Poverty Outlook, Forthcoming.
[3] Carbon Brief Indonesia, 2019.
[4] World Bank National Accounts data. Agriculture, forestry, and fishing, value added (percent of GDP)
[5] USAID (United States Agency for International Development). 2016.
[6] Cahagi, D., and R. Gurning. 2018.
[7] Stacey et al. 2021.
[8] World Bank 2020a.

shocks, including from climate change.

5. Vulnerability to climate change poses a key threat to the resilience of coastal livelihoods. Coastal villages are prone to flooding, changes in fish stocks, and declines in the viability of coastal agriculture and aquaculture. Women are particularly vulnerable to economic shocks due to gender disparities in asset ownership, and lower levels of access to formal financial institutions and inclusion in livelihood development programs[9]. Given their high dependency on protein from seafood and pressure on coastal natural resources, Indonesia's coastal communities are some of the most at risk globally.[10]

B. Sectoral and Institutional Context

6. Mangroves provide unique and critical services to Indonesia and the world; they are the focus of this project because of the key role they play within the country's broader natural resources' landscape. Mangroves have enormous carbon storage potential, sequestering five times as much carbon as tropical forests[11] and twice as much as peatlands. They provide habitat for numerous endangered, threatened, and unique animal species. They contribute to human well-being by attenuating storm surges and dissipating wave energy, reducing flood risk, erosion, and damage to coastal communities and assets.[12] The value of this coastal protection exceeds US$10,000 per hectare a year in parts of Indonesia. Mangroves also play a key role as fisheries refugia (marine or coastal areas in which specific management measures are applied to sustain important species) and nursing grounds; they are also a source of nutrients for species that are commercially harvested. About fifty-five percent of the total fish catch biomass in Indonesia consists of mangrove-dependent species, the total annual production of which is valued at US$825 million.[13] Mangroves also have tourism value of almost US$30 million a year, while firewood and timber extraction is worth an average of US$170 per hectare a year.

7. Indonesia has more mangrove forests than any other country; they are also more diverse than anywhere else. Spanning about 3.4 million hectares, Indonesia's mangroves account for over 20 percent of the global mangrove area.[14] Indonesia hosts 40 of the 54 global species of true mangroves. Indonesia's mangroves store nearly 4,000 tons of carbon dioxide (tCO_2) per hectare[15] (commonly referred to as "blue carbon"). About half of Indonesia's mangroves (1.82 million hectares) are "high quality," with no or minimal degradation. The remaining 1.58 million hectares of degraded mangroves (mangroves that have been partially converted to other land uses, such as aquaculture ponds) provide an important opportunity for rehabilitation.

8. Mangroves are a key component of livelihoods in coastal communities, providing important sources of food and income.[16] In mangrove villages, local communities often harvest shrimp, eel, clam, crab, sea snail, and a variety of fish species from mangrove ecosystems, which provide them income and food for families.[17] Dependence on mangrove forests for livelihoods varies based on poverty levels and land ownership, with households that are poorer and landless more dependent on the common property resources available in mangrove forests than wealthier households. Surveys

[9] Hatfield Indonesia 2021.
[10] WorldFish 2013.
[11] Murdiyarso et al. 2015.
[12] World Bank, The Economics of Mangroves, Forthcoming.
[13] United Nations Food and Agriculture Organization (FAO).
[14] Ministry of Environment and Forestry, National Mangrove Map, 2021.
[15] Murdiyarso et al. 2015.
[16] Evans, K. 2013, Hatfield Indonesia 2021.
[17] Armitage 2002.

of villagers commissioned by the World Bank in 2021 confirmed that they regard mangrove forests as important sources of income and food and recognize these forests for their fish habitat value and nontimber forest products.[18]

9. Coastal villages engage primarily in small-scale agriculture, fishing, and coconut palm harvesting for their livelihoods. In many coastal mangrove villages, the levels of economic development and basic services are low, and there is little formal enterprise or industry, and most producers are small, informal, and unregistered. Most villages lack an industrial center and have no more than two micro-industries. The majority rely on liquefied petroleum gas (LPG) or wood as the primary source of fuel. Coastal livelihoods are usually diversified, with most households having more than one livelihood, and are engaged in activities such as construction, mining, and primary processing.[19]

10. Most coastal communities have relatively weak market linkages and are poorly integrated into larger value chains. Remoteness, inadequate physical infrastructure, and limited access to financial services remain obstacles to the development of livelihoods in poor coastal communities. Coastal producers have limited access to formal financial services, such as savings' options, credit services, insurance, and transaction services. They have very limited access to markets outside the village and are poorly integrated into organized commodity supply chains.

11. Women are integral to coastal livelihoods, and often provide secondary incomes that are more stable than incomes from the irregular or seasonal activities that are dominated by men, such as farming and fishing. Most women engaged in economic activities in coastal areas are involved in post-production of primary commodities, such as cleaning, processing, and selling fish. They also engage directly in fishing and fish processing, the sale of mangrove forest products, and local trade (running small shops). Women in low-income households tend to bear a greater burden of generating income for families than do women in better-off families.[20]

12. Despite their significant value, Indonesian mangroves are still being lost—through deforestation, degradation, and unsustainable use—because of economic forces and institutional weaknesses. In the last 20 years, Indonesia's mangrove stock has undergone deforestation and degradation at the rate of approximately 13,000 hectares a year.[21] Perverse incentives drive deforestation and degradation. Economic forces result in mangrove conversion to high-value commodities. Conversion to aquaculture ponds for seafood accounts for almost half of the loss, followed more recently by the development of oil palm plantations, which account for 16 percent of mangrove loss in Indonesia.[22]

13. Conversion of mangrove areas into seafood aquaculture (shrimp, fish) has been the main direct driver of mangrove loss. Increased demand for seafood has led to massive mangrove conversion in various parts of Indonesia. Conversion of mangroves to brackish water aquaculture results in the drastic reduction of ecosystem goods and services. Rehabilitation of mangroves requires compromise by current land users, including the provision of concrete benefits to landholders.

14. Lack of acknowledgment of, and the inability to capitalize on, the high and diverse values of mangrove ecosystem goods and services, reduce incentives for conservation. Market mechanisms to incentivize private actors, including local communities, to provide ecosystem services such as carbon storage, remain limited.[23]

[18] Hatfield Indonesia 2021.
[19] Hatfield Indonesia 2021; Sensus Potensi Desa 2018
[20] Hatfield Indonesia 2021.
[21] Worthington and Spalding 2018.
[22] Richards and Friess 2016.
[23] World Bank 2021a.

15. Adding value to rehabilitated and existing mangroves is a key part of successful mangrove restoration. This can be achieved through the promotion of alternative livelihoods and payment for mangrove ecosystem services (such as blue carbon) or through labor in mangrove conservation and rehabilitation. Silvo-fisheries—the growing of mangroves within enclosed, actively managed ponds—are commonly recommended as a "win-win" solution, although further evidence is needed to ensure that this practice is a good one.

16. Lack of coordination and insufficient collaboration by institutions are also driving mangrove loss. Lack of overarching mangrove policies, inadequate enforcement of laws, and the exclusion of communities in decision making results in loss of mangroves. More than 20 institutions in Indonesia have some responsibility for mangrove management.[24] Limited participation of sub-national governments, communities, and the private sector in mangrove management also hampers coordination. Women play important roles in mangrove rehabilitation and conservation but are often excluded from broader planning and decision-making processes within communities[25]. At the national level, conflicting policies exist, with some policies aiming to protect mangroves and others encouraging aquaculture (particularly shrimp) and agriculture (palm oil) development for foreign cash earnings. Data and monitoring of the extent and condition of mangrove are limited and fragmented, making good management difficult. Climate change compounds these challenges by undermining the natural resource.[26]

17. The degradation and loss of mangroves put coastal communities that are heavily dependent on these resources at risk. Increasing flood risk and erosion directly affects the livelihoods of communities because of shoreline retreat and the loss of fishponds and agricultural land—as experienced in the heavily populated northern coast of Java. The loss of goods and services from mangrove conversion reduces access to nutritious food, energy (fuelwood), and healthy water resources.[27] Indonesian women, as well as poor and vulnerable community members are disproportionately disadvantaged by the lack of access to, and control over, healthy productive mangrove resources.

18. Mangroves are concentrated in nine provinces[28], which are home to 48 percent of Indonesia's severely and moderately degraded mangroves and 41 percent of Indonesia's potentially degraded forests [29] (such as brackish water aquaculture, erosional mangroves, and accretional areas).

19. The Government of Indonesia (GoI) is taking bold steps to reverse mangrove losses and rehabilitate degraded or deforested mangrove areas. In 2020, it launched the National Mangrove Rehabilitation program, with the ambitious goal of restoring 600,000 hectares of mangroves between 2021 and 2024.[30] It allocated over US$50 million in the national budget to mangrove rehabilitation as part of the National Recovery Program from COVID-19, with funds used largely to pay for labor in coastal communities (cash-for-work). Over 30,000 hectares of mangroves were restored in 2021 through actions led mostly by the Peatland and Mangrove Restoration Agency (Badan Restorasi Gambut dan Rehabilitasi Mangrove [BRGM]). The program is supported by Presidential Regulation 120 of 2020, which broadened the mandate of BRGM to include mangroves and extended its mandate until the end of 2024. In 2021, the GoI launched the updated National Mangrove Map as a part of the broader One Map initiative, signaling its intent to improve the quality of mangrove forest monitoring and the ability to measure progress in mangrove management efforts. The GoI is planning

[24] World Bank 2019.
[25] Stacey et al. 2021
[26] Lovelock et al. 2015; Woodroffe et al. 2016
[27] Stringer et al. 2018.
[28] North Sumatra, Riau, Kepulauan Bangka Belitung, Kepulauan Riau, North Kalimantan, East Kalimantan, West Kalimantan, Papua, and West Papua.
[29] 307,668 hectares out of 756,183 hectares (41 percent) of potential mangrove ecosystem.
[30] BPK RI 2020.

to adopt an overarching policy on sustainable management and conservation of the mangrove ecosystem and to strengthen multisectoral coordination platforms at the national and subnational levels, including through the participation of stakeholders from nongovernmental organizations (NGOs) and the private sector.

20. This project will support policy and institutional reforms as the foundation for more effective mangrove management, large-scale rehabilitation of degraded and deforested mangrove areas, and improved livelihoods of coastal communities. Mangrove rehabilitation entails physical and ecological interventions on the ground (such as hydrological works and the planting of seedlings) to rehabilitate ecosystem functions (such as carbon storage, coastal protection, and biodiversity habitat).[31] Sustainable mangrove landscape management aims to attenuate the continued degradation of existing and rehabilitated mangrove areas through land use planning, patrolling and, most importantly, the delivery of benefits to local communities. Sustainable use of mangrove resources entails the harvesting of mangrove products, such as non-timber forest products, fish, and crab, to increase the value of the mangrove ecosystem for local communities. Increasing sustainable use also involves monetizing the ecosystem services provided by mangroves and ensuring that these benefits are shared with local communities through blue carbon payments.

21. The project seeks to promote green, resilient, and inclusive development among coastal communities by deploying a landscape approach to mangrove management (conservation and rehabilitation), while strengthening the resilience of coastal communities. [32] It will promote landscape-level mangrove management by working with national, subnational, and local institutions (government, NGOs and local communities) to plan, execute, and evaluate mangrove management. Mangrove rehabilitation and management activities will be implemented at the community level by adopting the Mangrove Stewardship Village (*Desa Mandiri Peduli Mangrove*) approach, the GoI's village-based approach to empower communities and promote local economic development in mangrove areas. The project builds on years of experience in Indonesia with community-driven development (CDD) interventions and adapts the cash-for-work arrangements used by the GoI in its COVID-19 National Recovery Program (*Program Pemulihan Ekonomi Nasional* [PEN]).

22. The project will finance the rehabilitation of deforested and degraded mangrove areas and promote sustainable mangrove landscape management. It will build capacity at the national, sub-national, and village levels to assess sites for mangrove rehabilitation. It will use best-practice techniques to both increase the performance of mangrove rehabilitation and encourage institutional learning as a form of adaptive management. Successful rehabilitation will increase mangrove cover, biodiversity, productivity, and the value of mangrove ecosystem goods and services. These changes will increase environmental and socioeconomic resilience and provide an enhanced, diversified commodity base to improve livelihoods and safeguard coastal communities against shocks and disturbances, both natural and anthropogenic. The project will build capacity at the national and sub-national levels, support policies, and strengthen inter-institutional coordination to conserve and promote the sustainable use of existing mangroves to prevent further degradation and deforestation. It will support the GoI in leveraging additional finance from payments for "blue carbon," which is expected to be stored in rehabilitated mangroves and areas where conversion is avoided through conservation.

23. The project will improve the livelihoods of local communities,[33] understood as the broad range of activities people engage in and the assets, they use to support themselves. A livelihood is "sustainable" when it allows an individual to cope with and recover from stresses and shocks and maintain his or her capabilities and assets, both now and in the

[31] *Rehabilitation* is used in this document as an umbrella term for the application of one or more globally accepted techniques to rehabilitate the capacity of degraded mangroves to provide ecosystem services.
[32] The Indonesia Sustainable Landscape Management Program seeks to promote the landscape approach in order to support Indonesia's efforts to meet its goals for reducing emissions from the land use sector while improving the quality of life of natural resource–dependent communities. See www.worldbank.org/en/programs/indonesia-sustainable-landscapes-management-program.
[33] This project draws on the DFID 1990 Sustainable Livelihoods Framework.

future, without undermining the natural resource base. Livelihoods have five dimensions,[34] which are addressed through project activities and measured in the project results framework. The project addresses all five dimensions, through participatory, community-based activities at the village level and inclusive enterprise development.

24. The project aims to strengthen the absorptive, adaptive, and transformative capacities of the government, institutions, communities, and individuals to shocks and stresses, including climate change. Reducing the risk of exposure of communities to negative impacts through ecosystem protection and enhancing their preparedness would increase their resilience. Building skills and knowledge would increase the capacity to anticipate, learn, respond to, and recover from shocks and stresses. Strengthening new and improved livelihood opportunities and providing individuals with assets and resources could help reduce future risks and allow them to take advantage of new opportunities and adjust to new situations. Integrating sustainable resource management into village-level planning and increasing the role of women in mangrove management and village leadership could develop transformative capacity over time. The development of multi-stakeholder forums in target provinces to facilitate mangrove management builds both resilience and adaptive capacity by operationalizing institutions and networks that learn and store knowledge and experience, create flexibility in problem solving, and balance power among interest groups.

C. Relevance to Higher-Level Objectives

25. The project, Mangroves for Coastal Resilience (M4CR), will directly contribute to the World Bank Group's Indonesia Country Partnership Framework (CPF) for 2021–2025 (Report no. 157221-ID), particularly Engagement Area 4: Sustainable Management of Natural Assets, Natural Resources-Based Livelihoods and Disaster Resilience. It responds to all three objectives of this Engagement Area by strengthening the management of a key ecosystem, reducing pockets of poverty in coastal regions, and increasing resilience to coastal hazards. It will also contribute to Indonesia's COVID-19 green recovery, by promoting cash-for-work for labor-intensive coastal activities (mangrove rehabilitation, management, monitoring, and conservation) and creating business opportunities that will spur medium-term recovery.

26. The project is a critical element of the ongoing Sustainable Landscape Management Project (SLMP) in Indonesia. It is aligned with the recommendations of the *draft* Indonesia Country Climate Development Report (CCDR); the Climate Change Action Plan (CCAP); and the Green, Resilient and Inclusive Development (GRID) framework. The project adopts the landscape approach to achieve sustainable management of a critical type of ecosystem (mangroves), while supporting the livelihoods of communities that are dependent on natural resources. Modeling that was conducted under the *draft* Indonesia CCDR demonstrated the need for investment in restoration and conservation of mangroves to reduce emissions in the land use sector; mangroves, along with peatland and primary forests, are critical carbon-rich ecosystems and can contribute to these reductions. Indonesia's greenhouse gas emissions profile is unique in the East Asia and Pacific region because of its high level of land use-based emissions. This project supports the reduction of emissions from mangrove degradation and the enhancement of carbon stocks through mangrove rehabilitation, as advised by the CCAP. It seeks to achieve green, resilient, and inclusive development of coastal areas, a concrete application of the GRID framework.

27. M4CR will support the World Bank Group Gender Strategy (FY16-23), particularly the strategic objectives related to economic opportunities and enhancing women's voice and agency. The project aims to foster a more balanced

[34] According to the Sustainable Livelihoods Framework developed by the United Kingdom Department for International Development (DFID), ensuring livelihoods depends on five types of capital: natural (access to natural resources), human (access to skills, knowledge, abilities, etc.), physical (access to land, livestock, shelter, equipment, roads, etc.), social (access to status, networks, etc.), and financial (access to incomes, credit, investments).

distribution of power in decision-making on mangrove management. It will address gender disparities in access to economic opportunities, including by promoting the conditions for women's entrepreneurship and reducing skill gaps and occupational sex segregation.

28. M4CR will contribute to key government priorities and the government's climate change agenda. It will contribute to the country's midterm development plan (RPJMN 2020–2024), particularly Priority Area 1: Strengthening and improving resilience of the economy for quality growth and Priority Area 6: Improving the environment and resilience against natural disasters and climate change. The project will help Indonesia meet its commitment to reduce carbon emissions by 29 percent (up to 41 percent with international support) by 2030, as expressed in its Nationally Determined Contribution (NDC). The project will contribute to Indonesia's Forestry and Other Land Use (FOLU) Net Sink 2030 commitment, which aims to transform the FOLU sector, of which mangroves are an integral part, into a carbon sink by 2030. The project is a key tool for implementing Presidential Regulation 2020/120, which aims to rehabilitate 600,000 hectares of degraded mangrove by 2024 and expand the mandate of the Peatland Rehabilitation Agency to mangrove rehabilitation. The project will contribute to Indonesia's National Biodiversity Strategy and Action Plan (NBSAP), by supporting the conservation and restoration of habitats for rare and endangered species; the 2017 National Ocean Policy; the Aichi Biodiversity Targets; and Indonesia's efforts to achieve Sustainable Development Goal (SDG) 14: Life below Water.

II. PROJECT DESCRIPTION

A. Project Development Objective

PDO Statement

The Project Development Objective (PDO) is to enhance the management of mangroves and livelihoods of local communities in selected areas.

PDO-Level Indicators

- Policy framework for mangrove management improved (Score)
- Mangrove area rehabilitated and managed (Hectares)
- People using sustainable livelihood activities supported by the project (Number) (Percentage of which are women)

B. Project Components

29. M4CR will be implemented in four provinces that contain a significant portion of existing and degraded mangroves areas: East Kalimantan, North Kalimantan, North Sumatra and Riau, which are priority areas identified in Presidential Regulation No.120/2020. Additional provinces may be added during project implementation at the Borrower's request and in agreement with the Bank. Sites within the selected provinces will be identified during project preparation and implementation, using a robust site identification process that is detailed in the Operations Manual (OM).

30. The project will be financed through Investment Project Financing (IPF) with Performance-Based Conditions (PBCs).[35] Of the US$400 million of financing from the International Bank for Reconstruction and Development (IBRD), US$100 million is expected to be disbursed against PBCs and US$300 million as input-based financing. The Sustainable Landscape Management (SLM) Multi-Donor Trust Fund (MDTF)[36] will provide US$15 million of grant funding to finance Sub-components 1.1, 1.2, and 1.3, in line with the fund's goal of supporting improved landscape management. The Indonesia Oceans, Marine Debris and Coastal Resources (OMC) MDTF[37] will provide US$4 million in grant funding to finance Sub-component 1.4, in line with its goal of promoting innovations in blue finance. The processing of both MDTFs is underway with signed Grant Agreements expected by effectiveness.

31. The PBCs will sharpen the project's focus on key results. Component 2 will be partially implemented through the IPF-PBC modality (up to US$100 million), with costs shared between PBC- and input-based disbursements. The PBCs are expected to incentivize effective mangrove management, while enhancing the GoI's capacity to use results-based financing. Mangrove rehabilitation efforts by the GoI have traditionally been assessed based on investments made (such as labor engaged, or seedlings planted) rather than on results. The PBCs incentivize results on the ground while improving the quality of GoI spending, as funds are disbursed against outputs and outcomes. Table 1 describes the justification for each PBC. Section VII: Results Framework and Monitoring presents the full PBC descriptions.

Table 1. Justification for the Performance-Based Conditions

Performance-Based Condition	Justification	Indicative allocation (US$ million)
Mangrove area with appraised and approved rehabilitation plans (hectares)	Ensures that the key steps of assessment, design and planning for rehabilitation and monitoring (formalized in rehabilitation plans) are carried out. Plans ensure that activities are conducted in suitable areas and follow appropriate techniques and processes (output).	18
Mangrove area under rehabilitation and management (hectares)	Ensures that rehabilitation is implemented throughout the identified area based on agreed technical guidelines (output).	30
Mangrove area rehabilitated and managed (hectares)	Ensures that areas that have been rehabilitated experience a minimum survival rate, measured by stem density after 18 months of implementation on the ground (outcome).	45
Sub-national mangrove management plans submitted for approval and adopted (number)	Ensures that mangroves within the target provinces are managed based on a plan that has the buy-in of the relevant authorities (outcome).	7

32. PBCs will be verified using a verification protocol. The GoI will recruit a third-party agency as independent verification agent (IVA). The IVA will have the necessary qualifications and experience and will work under terms of

[35] The team explored using the Program for Results (PforR) instrument. It was not applicable because the social and environmental risks of the project are considered high, and the National Mangrove Program has not yet been formally institutionalized by GoI.
[36] The SLM MDTF has a closing date of June 30, 2024. The Bank team plans to seek an extension until 2027 in line with the expected closing date of this project.
[37] The OMC MDTF has a closing date of November 2022. The team has secured all clearances to extend it to 2025 and plans to seek an extension until 2027 in line with the expected closing date of this project.

reference satisfactory to the Bank to carry out the verification for the PBCs (see Section VII, Results Framework and Monitoring, for details on the verification protocol).

Summary of Project Components (see Annex 2 for a detailed project description)

Component 1. Strengthening Policy and Institutions for Mangrove Management (Grant: US$19 million; Sub-components 1.1-1.3 led by MoEF; Subcomponent 1.4 led by CMMIA)

33. Component 1 aims to strengthen the enabling policies and institutions to improve the management and financing of mangrove ecosystems.

1. Sub-component 1.1: Strengthening Policy, Governance, and Coordination (SLM MDTF: US$4 million). This sub-component will support: (a) development and strengthening of regulations and policies, on national and subnational levels governing sustainable management, of mangroves; (b) enhancement of national and subnational cross-sectoral coordination on mangrove management; (c) capacity enhancement of stakeholders involved in mangrove management through knowledge exchanges; (d) strategic communications; and (e) analytics and policy dialogue on mangrove management, including on land tenure issues in mangrove areas.
2. Sub-component 1.2: Improving and Updating the National Mangrove Map (Peta Mangrove National [PMN]) (SLM MDTF: US$4.7 million). This sub-component will support improvement and updating of the national mangrove map through, *inter alia*, (a) identification and inventorying of mangrove data; (b) design and development of a spatial data portal for information concerning mangroves; (c) improvement of institutional capacity in mapping mangroves and of related infrastructure; and (d) generation and dissemination of updated mangrove data and mapping products.
3. Sub-component 1.3: Registration and Monitoring of Mangrove Rehabilitation and Sustainable Mangrove Management (SLM MDTF: US$6.3 million). This sub-component will support, *inter alia*: (a) design and implementation of a monitoring system; (b) design and establishment of a mangrove sampling network with permanent plots; (c) development of a comprehensive methodology for mangrove monitoring; (d) update of the national registry to include mangroves; (e) clarification of the governance mechanism of the mangrove monitoring system; (f) integration of the monitoring system into the national mangrove program; and (g) operationalization of a mangrove information dashboard.
4. Sub-component 1.4: Preparation of Mangrove Blue Carbon Offset Readiness (Oceans MDTF: US$4 million). This sub-component will support development of a blue carbon program for making emissions reductions generated under the Operation eligible for payments, including, *inter alia,* through undertaking of necessary analysis and research, carbon measuring, reporting and registration, systems building, development of carbon regulatory framework and ascertainment of carbon rights and land tenure, development of a benefit-sharing plan, market testing, and capacity building for blue carbon finance readiness.

Component 2. Rehabilitating and Promoting Sustainable Mangrove Management (IBRD: US$300 million; led by BRGM and MoEF)

34. Component 2 aims to rehabilitate and manage mangroves through a landscape approach. It supports mangrove rehabilitation and sustainable mangrove management at the provincial and village levels in target provinces.

1. Sub-component 2.1: Large-Scale Community-Based Mangrove Rehabilitation (US$247 million). This sub-component will support rehabilitation of mangroves in Target Provinces through, *inter alia*: (a) establishment and operation of mangrove rehabilitation field schools, including their operating costs; (b) development of training curriculum modules for the field schools; (c) selection of rehabilitation sites, participatory rehabilitation design, work-planning, development of rehabilitation plans, and appraisal and approval of rehabilitation plans;

(d) rehabilitation of mangroves through a cash-for-work program, including provision of equipment and hand tools; and (e) maintenance, monitoring and mid-term corrections of rehabilitated sites.

2. Sub-component 2.2: Sustainable Mangrove Management (US$53 million). This sub-component will support sustainable management and protection of mangroves in select areas of the Target Provinces through, *inter alia*: (a) establishment and operation of Mangrove Stewardship Villages; (b) village-based mangrove management planning and integration into village sustainable development and spatial planning; (c) implementation of mangrove management activities, including training, awareness campaigns, forest monitoring, at the village level; (d) conflict resolution; (e) formation and enhancement of stakeholder forums in Target Provinces to strengthen mangrove management; and (f) preparation and adoption of subnational mangrove management plans for each selected province.

Component 3. Improving Livelihood Opportunities for Mangrove Communities (IBRD: US$80 million; led by BRGM and MoEF)

35. **Component 3 supports the development of livelihoods and sustainable enterprises in target villages to reduce the degradation pressure on mangrove forests and improve sustainable livelihood opportunities.** It will be financed through expenditure based IBRD disbursements.

1. Sub-component 3.1: Promoting Community-Based Livelihoods (US$18 million). The sub-component will support sustainable, community-based livelihoods activities in select areas of the Target Provinces through, *inter alia*: (a) carrying out rapid local livelihood assessments to develop tailored field training manuals for coastal field schools and enterprise skills training activities; (b) operationalizing coastal field schools to build the capacity of community groups on sustainable livelihoods; and (c) enterprise skills training to develop basic business literacy skills of the producers.

2. Sub-component 3.2: Coastal Enterprise Development (US$62 million). This sub-component will develop and support growth of sustainable enterprise activity in coastal communities through, *inter alia*: (a) carrying out site-specific market assessments; (b) development and operation of *Coastal Enterprise Development Matching Grants* to support coastal producer groups and/or buyers to finance business plans, capital and operating costs of new or expanded businesses; and (c) technical assistance and consulting services to support development and implementation of the business plans to be supported by the Coastal Enterprise Development Matching Grants, including on linkages with financial services.

Component 4. Operation Management (IBRD: US$20 million)

36. This component will support project management and coordination activities to ensure that the project is effectively managed and in accordance with fiduciary and environment and social risk management requirements. It will provide support for the PMO and PIUs in managing and overseeing project activities, including, *inter alia*: (a) staffing; (b) safeguards monitoring and compliance with the ESCP; (c) monitoring, evaluation and reporting activities, including for carbon monitoring and verification of the achievement of PBCs; (d) communication and stakeholder engagement; (e) fiduciary management; (f) costs associated with maintenance of the GRM; and (f) overall Incremental Operating Costs, audit costs, monitoring and evaluation.

Corporate Requirements

37. Climate co-benefits. This project aims to reduce climate change vulnerabilities from more extreme precipitation, increased drought, and sea level rise—and the associated increased risk of flooding, salinity, and erosion—which are expected to worsen because of climate change. Coastal areas are extremely vulnerable to climate risks. The project will

contribute to climate change adaptation and mitigation by strengthening the management of mangrove ecosystems. Rehabilitating and conserving ecosystems (Component 2) will help prevent further degradation and deforestation, sequester carbon and reduce emissions, and improve the resilience of coastal ecosystems. Diversifying livelihoods and promoting environmental sustainability of existing livelihoods (Component 3) will support mitigation by reducing pressure on mangrove and coastal resources and will support adaptation by reducing dependence on livelihoods that are vulnerable to climate risks. Annex 3 provides a breakdown of the climate change adaptation and mitigation measures.

38. Gender. An analysis of gender gaps, action planning and monitoring was conducted. The identified actions have been mainstreamed in the project to address the identified gender gaps. To measure the closing of these gaps, the Results Framework includes a dedicated gender indicator on women's economic empowerment, a target of 30 percent of female beneficiaries. This target is above the current practice. Other indicators will disaggregate results by gender where possible. The project's M&E system will include routine data collection on women's participation in project activities to track progress on gender, particularly women's participation in mangrove management institutions. The gap analysis and associated actions is summarized in Table 2 below and the detailed version is in Annex 3.

Table 2. Gender Gap Analysis and Results Chain

Gender Gap	Project Actions	M&E
Lack of representation and meaningful inclusion of women in local mangrove management institutions	• Increasing women's involvement in village-level mangrove management and development planning processes. • Integrating gender considerations such as gender assessment, sensitization, and action planning in the curricula of the Mangrove Field Schools. • Increasing women's participation in Mangrove Stewardship Villages and the Mangrove Management Field Schools.	• *Project M&E system:* Mangrove Management and Mangrove Rehabilitation Field School participants, share of which are women (target 50 percent women). • *Project M&E system:* Village Mangrove Management plans prepared, with planning meetings attended by 50 percent women (target). • *IR indicator:* Share of beneficiaries satisfied with the project's engagement and planning processes (percentage of which are women, target 30 percent).
Wage gaps and limited participation of women in cash-for-work programs for mangrove rehabilitation	• Quotas for female participants in mangrove management cash-for-work programs. • Establishing standards for the programs in the OM to prohibit wage discrimination.	• *IR Indicator:* People participating in cash-for-work activities supported by the project (percentage of which are women, target 50 percent).

Lack of access by women to improved or alternative livelihoods activities	• Identifying knowledge and skill gaps that prevent women from entering new industries and designing training to address them, including working with male and female community leaders in male-dominated livelihood activities to overcome barriers to entry for women. • Ensuring that coastal field schools will have women trainers and facilitators, and tailored content / methods to support the needs of women. • Promote the ability of women to compete for business grants, including through the design of eligibility criteria, awareness of grant facilities, and outreach activities, and technical assistance.	• *PDO Indicator:* People using sustainable livelihood activities supported by the project (percentage of which are women, target 30 percent). • *IR Indicator:* Share of producers and small business owners technically and financially supported by the project who are female (target 30 percent). • *IR Indicator:* People with increased knowledge and skills on sustainable livelihoods activities (percentage of which are women, target 30 percent).

39. Citizen engagement. The sustainability of the priority investments in conservation and rehabilitation will depend substantially on the meaningful participation and support of key stakeholders, especially local communities. Inclusion and participation of coastal communities has been integrated in the design of the investments. The project has set targets for the inclusion of vulnerable groups, particularly women, and includes activities to facilitate their access to benefits. Communities will be engaged through consultations on the planning and implementation of project activities. The beneficiary feedback loop will be maintained through a Grievance Redress Mechanism. The Results Framework includes a citizen engagement indicator (the share of beneficiaries satisfied with the project's engagement and planning processes), which will be measured through a beneficiary satisfaction survey to be conducted at midterm and at project completion. The project will finance the implementation of the Stakeholder Engagement Plan (SEP), which includes various forms of public engagement and feedback gathering on the project at the national, sub-national, and local levels, employing different media, as appropriate.

40. Mobilizing Finance for Development. The project will enable mobilization of private capital (MFD Enabling) within three years of project closure by addressing key binding constraints that are currently impeding private investment in nature-based solutions, including through support for the development of a blue carbon program, with the aim of generating private sector blue carbon payments from emissions reductions achieved under the project. The private sector is already expressing interest in these opportunities and will be ready to engage, once these binding constraints have been addressed. The longer-term goal is for the GoI to mobilize large-scale blue carbon finance from a variety of sources. Facilitating the development of sustainable businesses is a key objective of Component 3, which provides for co-financing from the private sector. The project will provide technical and investment support to businesses to address business constraints and unlock and enable private financing. It will also facilitate linkages between incipient businesses with GoI business support and private sector companies, which could lead to increased sustainable private finance (crowding in) in the longer term.

C. Project Beneficiaries

41. The main M4CR beneficiaries are the coastal households and community groups within the "Mangrove Stewardship Villages" selected in the target provinces. About 650,000 people in these villages are expected to receive direct and indirect benefits through the implementation of on-the-ground activities, include among others, skills

enhancement because of cash-for-work opportunities, village planning, participatory land-use planning, spatial planning, participatory rehabilitation design, enterprise support, and access to finance and markets to diversify livelihoods. Beneficiaries will include women, youth, and vulnerable or marginalized groups (including Indigenous People). Women are expected to comprise at least 30 percent of beneficiaries. Youth will be prioritized in business development activities. Indigenous communities will benefit particularly from livelihood support. Other beneficiaries include those who will benefit from increased resilience to climatic shocks and stresses provided by healthy mangroves, including millions of coastal people, as well as some living in large urban centers in the target provinces.

42. M4CR will also directly benefit the national and subnational institutions involved in mangrove management, through: (a) reinforced human resources, trainings, and knowledge sharing; (b) increased public revenue; (c) improved scientific and monitoring capacities; and (d) more effective management and governance of mangrove ecosystems.

43. The project will provide local, national, and global benefits through the provisioning of public goods. It will generate climate mitigation and adaptation co-benefits, such as carbon sequestration and improved resilience of local communities and coastal areas. It will contribute to biodiversity conservation and restoration, both directly (by enhancing the diversity of mangrove species in rehabilitated sites) and indirectly (by reducing the loss of healthy mangroves and enhancing the habitat for species that directly depend on mangroves).

D. Results Chain

44. M4CR uses an integrated landscape management approach that supports simultaneous investments and policies to strengthen the resilience of coastal ecosystems and coastal communities. Figure 1 presents the project's Theory of Change.

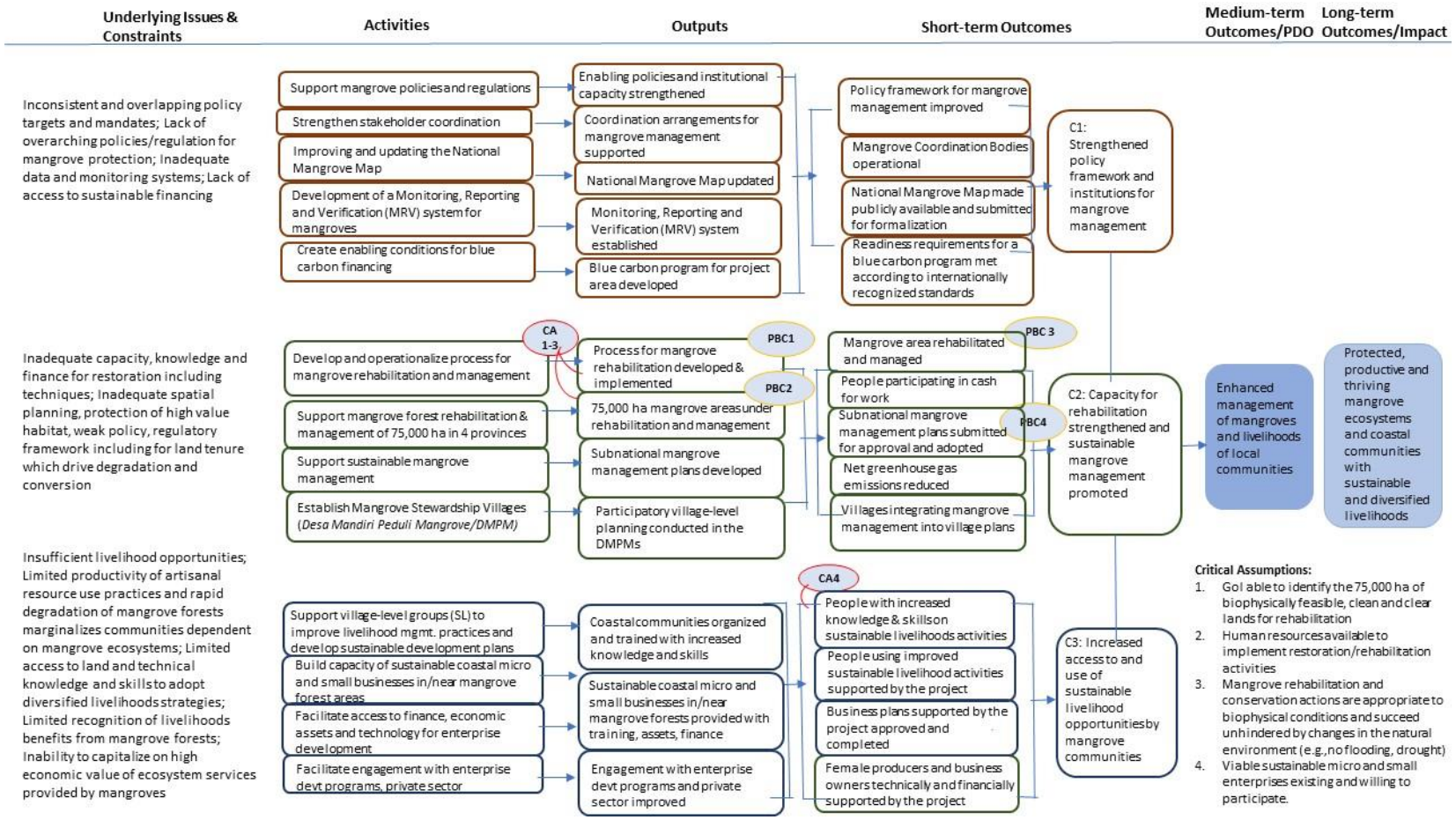
E. Rationale for Bank Involvement and Role of Partners

45. The World Bank has significant experience and a track record of providing technical assistance and investment financing to governments in building coastal resilience, having supported coastal resilience in countries such as Brazil, India, and Vietnam. It brings knowledge of global best practices in mangrove rehabilitation including an emphasis on planning to understand the hydrological, vegetative, and soil conditions of an area before restoring as well as adapting different rehabilitation methods to specific local conditions. The Bank has deep experience with the tools to ensure the involvement of and benefits to local communities and proposes a robust M&E system. It brings significant technical assistance on innovative topics, such as nature-based solutions for coastal management and mechanisms to leverage blue finance (carbon payments).

46. The Bank has been supporting the mangrove agenda in Indonesia since 2019. Bank support has included policy dialogue and advice to government entities (the Ministry of Marine Affairs and Fisheries, the Coordinating Ministry for Maritime and Investment Affairs, and the Ministry of National Development Planning) and subnational governments. The Bank has financed analytical work relevant to mangroves through the Indonesia Oceans MDTF, PROBLUE,[38] and the SLM MDTF.

[38] PROBLUE is an umbrella multi-donor trust fund administered by the World Bank that supports the sustainable and integrated development of marine and coastal resources in healthy oceans.

Figure 1. Theory of Change of the Mangroves for Coastal Resilience Project



Notes: CA means critical assumption; PBC means Performance-Based Condition; C1, C2, and C3 refer to project components

47. Implementation of MC4R will be coordinated with initiatives financed by other development partners. These initiatives include the Germany-supported Forest Program II, mangrove initiatives funded by the US Agency for International Development (USAID), and support from the United Arab Emirates and the Korean Peace Forest Initiative. The National Mangrove Working Group (Pokja Mangrove), which the project will support, will lead regular donor coordination meetings.

F. Lessons Learned and Reflected in the Project Design

48. M4CR builds on lessons learned in Indonesia and globally on mangrove management and livelihood promotion. It draws on projects in Indonesia, such as the Coral Reef Rehabilitation and Management Program-Coral Triangle Initiative (COREMAP-CTI, P130389) and the Indonesia Support for Village Development PASA (P174562), and projects in other countries, such as the Enhancing Coastal and Ocean Resource Efficiency Project in India (P167804) and the West Africa Coastal Areas Management Program (WACA, P162337, P166218). Lessons are also drawn from previous government programs and projects financed by other partners, particularly the Sustainable Ecosystems Advanced (USAID) and the Coastal Community Development Project (International Fund for Agricultural Development [IFAD]).

49. Effective mangrove rehabilitation requires detailed planning, post-rehabilitation management, and the close involvement of local communities and governments. It tends to fail where only planting of mangrove seedlings is prioritized, and plans are not adequately developed for maintaining mangrove areas following rehabilitation. The Bank-financed Central Visayas Regional Project in the Philippines rehabilitated more than 900 hectares of mangrove, but less than 19 percent survived. The project team noted that future work should focus on protection and rehabilitation. A comprehensive study in Sri Lanka demonstrated that most mangrove rehabilitation sites had less than 10 percent survival five years later, which it attributed to mass planting in areas without the removal of stressors and impaired hydrology. M4CR seeks to address these challenge by (a) using rehabilitation techniques appropriate to each site, (b) creating incentives for the conservation and sustainable use of mangroves through sustainable livelihood activities and payments from blue carbon, (c) enhancing institutional capacity for monitoring and adaptively managing existing and rehabilitated mangrove forests, and (d) using results-based payments based on post-rehabilitation performance to incentivize post-implementation management (through PBCs).

50. Addressing the drivers of mangrove loss (degradation and deforestation) is critical for building resilience and sustainability. Mangrove deforestation in Indonesia has been driven by a national need for foreign exchange earnings, global demand for products such as shrimp and palm oil, and the lack of perceived value by local communities for the diverse range of ecosystem goods and services provided by mangroves. M4CR will address the drivers and root causes of degradation to increase appreciation of the high and diverse range of values provided by healthy, intact mangrove landscapes. Enhanced coordination among institutions, collaboration with coastal communities, improved capacity to manage mangroves, and enhancement of the value of mangroves to local people are key objectives of the M4CR.

51. Creating community buy-in for mangrove rehabilitation is vital for success. World Bank–financed mangrove rehabilitation investments in the East Asia and Pacific and South Asia regions—such as the Kiribati Adaptation Program–Phase III (P112615) and the Bangladesh Climate Resilient Participatory Afforestation and Reforestation Project (P127015)—have demonstrated that sustained engagement with local communities throughout project implementation is necessary to ensure participation, cultivate a sense of ownership, and ensure the sustainability of project outcomes. In Kiribati, continued engagement empowered local beneficiaries to take an active role in decision making on mangrove

use and recognized the needs and priorities of different stakeholders. M4CR will work closely with, and involve, local communities and mangrove groups. It will provide (a) short-term incentives for participation through cash-for-work (*padat karya*) approaches and (b) long-term opportunities by training local communities and facilitating access to markets and starting and/or expanding businesses.

52. A market approach is needed to promote the diversification of sustainable livelihoods and should be embedded in existing programs. Promoting market-based approaches to livelihoods requires addressing several barriers, including infrastructure, skills, and access to finance and markets. Livelihood development through a market approach takes significant time, beyond the time frame of individual projects. It should therefore be embedded in national programs, such as those aimed at providing access to finance and enhancing business and technical skills. M4CR will address these barriers by (a) strengthening and incentivizing micro, small, and medium-size enterprises through skills strengthening and (b) facilitating access to finance from different sources, including existing enterprise development programs and financial institutions. Business facilitation will be provided by specialists deployed by the implementing agencies. Strengthening the capacity of community-based organizations and producer groups is critical to support local businesses and enhance collective action in managing natural resources. Promotion of livelihoods will be coordinated with the Village Law Program. Participating villages will be incentivized to include coastal management activities (including simplified local spatial plans) in their regular planning and budgeting processes. M4CR village facilitators will coordinate with regular village facilitators when providing services to villages and local communities. The project will strengthen the institutional capacity of key agencies, such as MoEF and BRGM, to implement market-driven livelihood enhancement approaches.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

53. Project implementation arrangements are embedded in the existing institutions. At the national level, the MoEF will act as the Executing Agency. MoEF, BRGM, CMMIA and IEF will be the Implementing Agencies, with the IEF[39] as the fund manager. A National Steering Committee (NSC) will be established to provide strategic guidance on project implementation, consisting of an inter-ministerial member, include MoEF, BRGM, the Ministry of Marine Affairs and Fisheries (MMAF), the Ministry of Finance, the Ministry of Home Affairs, the Ministry of Villages, and the Ministry of National Development Planning (Bappenas). The NSC will be chaired by the Coordinating Ministry of Maritime Affairs and Investment (CMMIA). The MoEF will execute the project through A Project Management Office (PMO) housed at the Directorate General of Watershed Management and Forest Rehabilitation (DG PDASRH) to ensure that the project is implemented in line with its design and the legal agreements governing it

54. At the provincial level, Provincial Project Implementation Units (PPIUs) will be established in each target province under MoEF's Provincial Representation Office (UPT/Balai), to support the implementation of project activities implemented by different agencies (sub-national office/dinas, NGOs, etc.).

[39] The costs associated with IEF's role as fund manager will be covered by the grant funding from the Sustainable Landscape Management Program (SLMP) Multi-Donor Trust Fund (MDTF).

55. The Bank will provide implementation support, provide technical assistance, and conduct analytical work linked to this the project through Bank-executed trust funds provided by the Oceans MDTF.

56. Annex 1 provides details on the institutional arrangements and Operations Manual will be prepared detailing project implementation arrangements, fiduciary and safeguards rules, and technical details.

B. Results Monitoring and Evaluation Arrangements

57. The project will build on the existing M&E systems used by the implementing agencies and will strengthen them where necessary. M&E functions will be housed within the Project Management Office (PMO) and the PIUs, using existing capacity. The OM will include an M&E chapter that outlines the protocols and responsibilities, as well as the custom report templates. Component 2 will be monitored through site assessments that involve local communities engaged in rehabilitation and mangrove management. Component 3 will draw on existing monitoring systems and capacity within BRGM, complemented by external capacity where needed. M&E of activities related to livelihoods will use village facilitators stationed in the target villages, who will be responsible for documenting progress, e.g., facilitation of public meetings, development of village-level plans, expenditures, and results from livelihood activities, including training, and community small infrastructure development.

58. PBCs will be verified as part of monitoring the Results Framework indicators, detailed in Section VII. Independent verification agents will carry out the annual verification. The results will be submitted to the World Bank before PBC disbursements are made.

C. Sustainability

59. The project builds on national systems while strengthening institutions to ensure sustainability. Implementation is fully embedded within MoEF, BRGM and CMMIA. The fund management role of the IEF will help develop its capacity as the dedicated institution for the management of climate finance. Component 1 activities are expressly designed to develop a policy and regulatory environment conducive to continued mangrove management, through training, development of regulations, and data systems (for example, the National Mangrove Map) that underpin rehabilitation and conservation actions within and beyond the project. Sustainability is further promoted by forums for cross-sectoral coordination and support for solidifying mandates, increasing understanding across agencies, and strengthening long-term monitoring systems. In addition, capacity building is supported at all levels of the project, strengthening knowledge of management, technical mangrove aspects, entrepreneurial capacity and livelihoods improvements.

60. The project aims to address the underlying drivers of mangrove loss, embed mangrove management within local decision-making systems, and align economic interests with mangrove conservation and restoration. The project addresses an important driver of mangrove loss: the failure to internalize or capitalize on the values these ecosystems provide, including carbon sequestration and supporting services for tourism and fisheries. The livelihood component will provide access to finance and knowledge required to develop small business opportunities and better align economic interests toward conservation. These efforts will be complemented by the explicit inclusion of mangrove management within the village-level planning and decision-making apparatus (village plans and village councils) to ensure ownership and tailoring of implementation at the local level.

61. The results orientation of the project supports sustainability by incentivizing long-term management. By increasing the capacity to draw on carbon financing, the project adds an important incentive to develop and institutionalize the systems necessary for the achievement long-term results. The use of PBCs places emphasis on results, which is important given the low rates of success of earlier efforts. PBCs aim to ensure that important technical improvements in rehabilitation practices are made, including the adoption of new techniques and site selection that reflects local conditions.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic, and Financial Analysis

62. Mangrove rehabilitation will integrate normative GoI practices, for which policy and mandates exist, with global best practices. Indonesia's mangrove rehabilitation policy mandates rehabilitation (*memulihkan*) in degraded mangrove areas (0–30 percent cover) and potential ecosystems where mangroves have been converted (aquaculture ponds, that erode mangrove and other coastal areas, accretional coastal areas and barren intertidal land); mangrove enhancement (*meningkatkan*) in moderately degraded mangrove areas (30–70 percent cover); and protection from direct biophysical damage (*mempertahankan*) using permeable dams and wave breakers in intact but threatened mangrove areas (70–90 percent cover). The project will therefore apply different globally proven rehabilitation techniques based on the baseline condition of the mangrove area. It is estimated that most of the mangrove rehabilitation (65,000 hectares) will involve direct planting. However, additional techniques will be piloted in 10,000 hectares based on site requirements and the development of policy allowing the application of new techniques.

63. Mangrove management (rehabilitation and reduced mangrove loss) can be achieved only with the strong participation of and benefits to local communities. The livelihood enhancement component (Component 3) will directly address drivers of mangrove loss by introducing and strengthening sustainable production practices in target villages. It will (a) work with inclusive coastal field schools to promote sustainable production practices in coastal livelihood activities and (b) identify and support viable, competitive opportunities for businesses in sustainable commodity value chains through business grants. These activities will address capacity, productivity, and competitiveness constraints to sustainable mangrove-based livelihoods and enterprise development in target villages.

64. Mangrove management activities and livelihood enhancement activities will be implemented synergistically. Table 3 highlights the complementarity between these components.

Table 3. Links between Components 2 and 3

Feature	Community-Based Mangrove Rehabilitation (Component 2.1)	Sustainable Mangrove Management (Component 2.2)	Livelihoods (Component 3)
Activity	Rehabilitation of 75,000 hectares.	Formation of Mangrove Stewardship Villages (Desa Mandiri Peduli Mangrove [DMPM]), village planning and development and implementation	Establishment of coastal field schools and enterprise development through matching grants.

		of village mangrove management plans, sub-national multistakeholder forums, and development of subnational mangrove management plans.	
Location	Four provinces.	Four provinces.	Four provinces.
Villages selected for intervention	Approximately 300 villages in the four provinces.	300 villages plus approximately 24 additional villages (where no rehabilitation is needed).	300 villages plus approximately 24 additional villages (where no rehabilitation is needed).
Key beneficiary selection	Participants in mangrove field schools will be selected from the villages.	Additional villages are selected based on proximity to intact mangroves.	Participants in coastal field schools and business grant beneficiaries will be selected from the DMPM.
Indicative sequencing of activities and linkages across components	• Villages will select participants for mangrove rehabilitation field schools. • Field schools will be run. • Rehabilitation will be implemented and monitored.	Across all villages: • DMPM will be formed. • DMPM will develop holistic mangrove management plans. • Plans will be integrated with the sustainable development plans of villages and district-level spatial plans. • Mangrove management activities will be implemented. At the province level: • Multistakeholder forums will be formed or reinvigorated. • Analyses will be carried out (such as determining the drivers of degradation and deforestation). • Integrated sub-national mangrove management plans will be developed.	After DMPM are selected and multistakeholder forums formed (C2.2): • DMPM will select the participants for coastal field schools. • Coastal field schools will be run to improve livelihoods, based on areas prioritized in the village mangrove management plans (C2.2). • Producers/businesses will be facilitated to improve and develop small enterprises in areas prioritized in village mangrove management plans (C2.2).

65. The project is designed to significantly reduce greenhouse gas emissions and uses a resilience framework. The project aims to strengthen the absorptive, adaptive, and transformative capacities of the government, institutions, communities, and individuals to shocks and stresses, including climate change. Rehabilitation and sustainable management of mangroves will reduce greenhouse gas emissions, because mangroves are among the planet's most carbon-rich ecosystems.

Economic and Financial Analysis Summary

66. A benefit–cost analysis was undertaken to quantify the project's expected socioeconomic benefits. The Project is expected to generate quantifiable socioeconomic benefits, including: (a) production of increased fisheries and mangrove derivatives; (b) increased tourism activity; (c) increased coastal protection; (d); carbon sequestration; (e) income opportunities from sustainable livelihoods; and (f) short-term work opportunities from mangrove planting, aiming to contribute to post-COVID economic recovery. The analysis uses a 30-year time frame to account for the long-term nature of many of these benefits.

67. Restoration activities. Values for fisheries, tourism, coastal protection, and carbon sequestration were derived from published state-of-the-art valuation studies. Spatially explicit values were averaged (weighted by mangrove density) at the national level and applied to the expected extent of Project afforestation, reforestation and revegetation (ARR) and avoided deforestation (AD). A carbon price of US$5 per tCO_2e was used, with further analysis at US$44 per ton, in line with the World Bank's lower-bound social cost (shadow price) of carbon.[40] With and without Project scenarios accounted for pre-existing mangrove cover within ARR sites and expected survival rates. At a US$5 carbon price, the project's proposed 75,000 hectares of ARR activities (of which 45,000 ha is assumed as the effective project area) have a benefit–cost ratio of 4.69 at a discount rate of 6 percent.[41]

68. Avoided deforestation activities. Benefits from fisheries, tourism, coastal protection, and carbon sequestration were estimated as the value of the avoided loss of mangrove expected because of improved management. Avoided losses were calculated using a counterfactual degradation assumption (that is, what would happen in the absence of the Project) of 0.81 percent. The proposed AD activities on 400,000 hectares have a benefit–cost ratio of 7.97 at a discount rate of 6 percent.

69. Livelihood activities. Benefits from livelihood activities (specifically field school training, value chain improvements, financial services, and technical advising) were approximated based on observed increases under similar programs in Indonesia. The proposed activities have a benefit–cost ratio of 2.18 under conservative assumptions regarding per-participant returns on livelihood investments.

70. Aggregated activities and scenarios. The Project is estimated to have an overall NPV of US$679 million and benefit–cost ratio of 3.36 under reasonable assumptions. Component 1 (institutional strengthening) is not included in this estimate and could add further benefits via its impacts on mangrove management beyond the Project locations. Use of a higher social cost of carbon (US$ 44) increases benefits substantially (NPV of US$ 1,934 million) in line with the significant mitigation outcomes expected.

71. Comparison with global costs. Mangrove rehabilitation costs in the project are estimated to total US$2,731/ha, at the lower end of the global range, as shown in Table 4. The cost of transactions raises costs to US$5,333/ha, still at the lower range of costs. In Indonesia, mangrove rehabilitation costs are estimated to be US$23,421/ha, based on opportunity, implementation and transaction costs.[42] Transaction costs were proportionately the largest in the above

[40] US$5 is a realistic monetary value of the Project's blue carbon credits.
[41] 5.5 percent is approximately twice the long-term (20-year) GDP per capita growth rate for Indonesia (see World Bank 2016).
[42] Brown, 2021.

estimate, and these have been significantly lowered in the M4CR project by capturing economies of scale.

Table 4. Implementation costs of mangrove rehabilitation globally

Cost (US$/ha)	Method	Location	Reference
225–500,000	Global review	Global	Lewis (2001)
500–54,300	Global review	Global	Narayan *et al* (2016)
2,508–52,006	Global review	Global	Bayraktarov *et al* (2016)
252,047–1,065,022	Hydraulic sediment spraying	United States	Turek (2015)

B. Fiduciary

Financial Management

72. Financial management (FM) of the operations will rely largely on the existing government system, which includes budgeting, accounting, reporting, internal control, and auditing. However, the processing of the loan and the use of the IEF to channel funds requires a regulation by the Ministry of Finance (*Peraturan Menteri Keuangan* [PMK]) to support the agreed financial management arrangement of the operation, which is a condition of effectiveness.

73. A Financial Management Assessment (FMA) was carried out to assess the adequacy of the financial management system of the implementing agencies to produce timely, relevant, and reliable financial information of the operation. The FMA identified the limited experience of the implementing agencies in managing World Bank–funded operations as the main FM risk. The geographically dispersed locations may also create challenges to monitoring and supervising budget execution and to preparing consolidated financial reports without delays. The risk mitigation actions proposed include: (a) development of an Operations Manual (OM) and its approval by the World Bank (b) the hiring of financial management consultants to support the PMO and IEF and build the capacity of the implementing agencies on financial management; (c) appointment of the Supreme Audit Institution, *Badan Pemeriksa Keuangan* (BPK) as the external auditor of the operations. The OM will include detailed information on the roles and responsibilities of the executing agency/PMO, PIUs, PPIUs, and the IEF, as well as the arrangements for planning, budgeting, fund flow, the payment process, accountability and financial reporting, a verification protocol for disbursement against performance-based conditions, matching grants, monitoring, and audit. Ongoing technical assistance by the World Bank to the IEF will build its capacity to administer funds and the proposed operations. The FMA concluded that implementation of the agreed actions will substantially mitigate the risks and that the proposed financial management arrangements will satisfy the World Bank's minimum requirements. A summary of the financial management arrangements is provided in Annex 1.

Procurement

74. Applicable Procurement Framework. All procurement of goods, works, non-consulting services and consulting services under the project will be carried out in accordance with the World Bank Procurement Regulations for IPF Borrowers, dated November 2020 (the Bank's Procurement Regulations) and the provisions stipulated in the Loan and Grant Agreements, as well as the approved Procurement Plan. The project will be subject to the World Bank's Anti-Corruption Guidelines, dated October 15, 2006, revised in January 2011, and as of July 1, 2016. The project will use the Systematic Tracking of Exchanges in Procurement (STEP) to plan, record, and track procurement transactions.

75. Project Procurement Strategy for Development (PPSD) and Procurement Plan (PP). The PPSD has been prepared by the IAs (MoEF, BRGM, CMMIA, IEF) with support from the World Bank procurement team. The IEF role in procurement will be limited to the MDTF grant financing. The PPSD includes detailed assessments of the markets for goods, works, non-consulting and consulting services that are required for project implementation, procurement approaches including CDD procurement, and analysis of procurement risks along with the corresponding risk mitigation measures. Based on the PPSD, the PIUs have jointly prepared the Procurement Plan (PP) for the first 18 months of project implementation that was agreed with the Bank during loan negotiation. The PP is a living document and will be updated at least annually or as required during project implementation to reflect any substantial changes in procurement approaches and methods to meet implementation needs, market fluctuations, and improvements in institutional capacity. The updated PP along with the revised PPSD will be subject to the Bank's prior review and approval.

76. Use of National Procurement Procedures. When approaching the national market as agreed in the Procurement Plan, the country's own procurement procedures (Perpres No.16/2018) may be used for the procurement of goods, works, and non-consulting services. The procurement procedures shall be consistent with the Bank's core procurement principles and meet the conditions specified in paragraph 5.4 of the Procurement Regulations and in the text of the Procurement Plan.

77. Procurement capacity and risk assessment. Procurement will be carried out by IEF (for grant funding), BRGM and MoEF. The procurement capacity and risk assessment concluded that the project's residual procurement risk is Substantial due to the following: (a) the limited experiences of MoEF and IEF in carrying out procurement as per the Bank's procurement regulations, and with BRGM having no experience; (b) the very limited human resource capacity of IEF to carry out procurement; (c) low procurement readiness in the first year of the project; (d) lack of systematic monitoring and evaluation (M&E) of procurement and contract performance; and (e) lack of support and coordination from the other IAs to support IEF in carrying out procurement, which could affect the quality and timely implementation of procurement. Details on the risk analysis and the corresponding mitigations measures are presented in Table A1.3 of Annex 1.

C. Legal Operational Policies

	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

D. Environmental and Social

78. The project's overall Environmental and Social risk classification is Substantial, with both Environmental and Social risks rated as Substantial. The rating is based on the typology of investments, institutional capacity, the experience of the implementing institutions with similar work, and general implementation challenges. The social risk is rated Substantial because of the diverse social contexts within the target provinces, which include: (a) existing and potential land and tenure conflicts, (b) the presence of Indigenous Peoples and other vulnerable communities that depend on mangrove forests; and (c) unproven institutional capacities to address complex social issues, such as land/tenurial rights and social conflicts. The risk of sexual exploitation, abuse, or harassment is deemed to be moderate, because: (a) the

project is not expected to generate a significant labor influx, as construction activities will be small to medium size, with high reliance on local community workers, and (b) most locations will be remote, with limited opportunities for sexual exploitation, abuse, or harassment. However, the project will support tourism within the selected sites, which may attract more visitors.

79. Improving the management of mangroves in communities that are highly dependent on the unsustainable extraction of natural resources may potentially trigger and/or exacerbate existing tenure and resource conflicts in the targeted areas. Some communities may refuse to release control and use of the land (partially or in full) for mangrove rehabilitation and/or conservation, because of perceived livelihood impacts (on fish/aquaculture ponds, for example). The project is also expected to be implemented in areas where Indigenous Peoples and/or *Adat* communities live. These communities may have local wisdom and practices regarding land and resource use and claims on mangrove areas. As many of these communities may live in forest estates and/or areas with tenure conflicts, their tenure may not be recognized and protected. Improvements in mangrove management practices could have adverse implications on their access to livelihoods and tenure. The project will conduct a systematic land tenure and property rights assessment to clarify tenurial issues and invest in interventions and conflict resolution. The project will work with the owners of actively managed aquaculture ponds on silvo-fishery rehabilitation techniques and engage with them to improve the sustainability of aquaculture practices.

80. The project does not expect to finance large-scale infrastructure works that may cause significant negative environmental or social impacts. The cumulative impacts and direct and indirect environmental impacts are expected to be positive through the reduction in emissions, erosion, and other forms of land degradation; improvements of conservation and biodiversity; and positive effects on mangrove ecosystems. Potential risks and impacts may be associated with general land-based management of restoration activities, including the harmful use of chemicals, the possible introduction of invasive species, the effects of small-scale civil works, the management of construction waste related to civil works, risks to occupational and community health and safety, and the potential use of child labor. Use of child labor will be included in the negative list, and the capacity of the project implementing agencies to monitor and enforce such requirements will be assessed as part of proposal verification during project implementation.

81. The intended project outcomes are dependent on the quality of implementation of specific activities. Weak capacity to adhere to good practices in natural resource management and lack of inclusive consultative processes, participation, community ownership, and transparency in decision-making processes may heighten the risks, especially where conflicts exist, and the trade-offs associated with communities' high dependence on mangrove resources. Environmental risks and impacts are expected to be temporary, site-specific, and predictable and will be mitigated through standard mitigation procedures and the application of good engineering practices. Good practices in community engagement and participation are expected to be adopted, as they have been in similar interventions in Indonesia.

82. The project is expected to generate positive environmental and social outcomes, despite the risks highlighted above. It has the potential for significant positive environmental impacts through mangrove rehabilitation, the promotion of conservation of large-scale mangrove landscapes and building capacity for these activities at the national and subnational levels. The project will apply robust mangrove rehabilitation processes using globally recognized techniques. It will support the development of mangrove-based livelihoods to reduce degradation pressure on mangrove forests and improve sustainable livelihood opportunities. Through policy development support, the project will aim to strengthen enabling policies and institutions to improve conservation, sustainable resource use, adaptive management, and the financing of mangrove ecosystems. The development of a mangrove management policy framework and

supporting tools are expected to create the enabling conditions for receiving payments for blue carbon.

83. Several agencies and local partners with varying environmental and social capacities will implement the project. Although the experience of the three PIUs— MoEF, BRGM and CMMIA—with World Bank–financed operations is limited, these agencies have overseen mangrove rehabilitation and conservation in Indonesia. An operating system to mitigate and manage environmental and social risks has been established as part of the previous and ongoing mangrove rehabilitation and conservation efforts, which have capitalized on community-based approaches. The Standard Operating Protocols (SOPs) for mangrove rehabilitation have incorporated environmental and social risk management procedures, and are being enhanced through the Environmental and Social Management Framework (ESMF). The ESMF and the OM detail the capacity-building measures that will be undertaken during project implementation.

84. The project is designed to integrate environmental and social measures in its business process. Risk prevention and mitigation measures will be embedded in the project design. Community consensus will be sought before the initiation of activities with potential impacts. If livelihoods are affected because of restrictions on land and resource use, relevant mitigation measures will be developed with the affected stakeholders in a participatory manner. The Project has adopted a risk mitigation hierarchy (preventing risks, mitigating, and preparing the response when the risk emerges/ incidents occurs) in the ESMF, which includes specific requirements to address potential risks, including risk screening, community-based decision-making processes, operational guidance for the preparation of specific Environmental and Social Management Plans (ESMPs), and feedback and grievance redress mechanisms. The ESMF covers the Indigenous Peoples Planning Framework (IPPF), the Process Framework, and guidelines for willing-buyer and willing-seller land transactions, as well as voluntary land donations. It also provides guidance on applying and operationalizing environmental and social instruments and customizing them during project implementation based on context-specific needs and risk management. The OM will provide further details for their operationalization as needed.

85. Stakeholder engagement on the project design is being pursued through ongoing dialogue, including community-level consultations. Engagement with local communities was conducted through a household survey during July–August 2021. The project's environmental and social documents, consisting of the draft Environmental and Social Management Framework (ESMF), the Stakeholder Engagement Plan (SEP) and the Environmental and Social Commitment Plan (ESCP) were disclosed on the external website on March 10, while the ESRS on March 7. A national-level public consultation on the project design and environmental and social instruments, involving government and non-government stakeholders, including non-government organizations (NGOs) and think-tanks was held on February 16, 2022, followed by an open call for public feedback. The stakeholders' feedback center around the following aspects: (a) inclusive involvement of key stakeholders to promote social license to operate and sustainability; (b) land tenure issues and conflict resolution mechanisms, including consensus building with land owners and/or occupants; (c) long-term maintenance of re-planted mangroves and exit strategy; (d) clarifications on the roles of sub-national governments, particularly the provincial governments, Forest Management Units (FMUs) and village governments; (e) options for mangrove rehabilitation across different types of land uses, administrative jurisdictions (forest and non-forest estates), and political economy contexts; and (f) livelihoods for coastal communities. Previous community engagement provided a broad understanding of socioeconomic and gender relations and informed the project design. To establish a set of parameters for meaningful consultations and dialogue, a stakeholder engagement plan was developed. A social mapping exercise (village-level assessment) will be conducted as part of a multi-tier site selection process that will include a site-specific stakeholder analysis and a political economy analysis of land use and land ownership. The existing Feedback Grievance Redress Mechanisms (FGRMs) within MoEF and BRGM will be reinforced during project implementation. These requirements have been incorporated in the project's ESCP and are further elaborated in the ESMF and SEP.

V. GRIEVANCE REDRESS SERVICES

86. Communities and individuals who believe they are adversely affected by a World Bank–supported project may submit complaints through project-level grievance redress mechanisms or the Bank's Grievance Redress Service (GRS). The GRS ensures that complaints are promptly reviewed in order to address project-related concerns. Project-affected communities and individuals may submit their complaints to the Bank's independent Inspection Panel, which determines whether harm occurred, or could occur, as a result of Bank noncompliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the Bank's attention and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate GRS, please visit *http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service*. For information on how to submit complaints to the World Bank Inspection Panel, please visit *www.inspectionpanel.org*.

VI. KEY RISKS

87. The risk to achieving the PDO is rated Substantial. Risk categories rated Substantial, or High are explained below, along with the corresponding mitigation measures.

88. Sector Strategies and Policies Risk (Substantial). Rehabilitating and conserving existing mangroves require coherent policies, such as those in the aquaculture sector. This project aims to strengthen cross-sectoral coordination by funding policy and coordination strengthening. The Bank will continue to engage in high-level policy discussions on the mangrove agenda. The use of performance-based funding increases oversight of rehabilitation results by the Ministry of Finance and will be an added incentive for policy reforms.

89. Technical Design Risk (Substantial). Several technical risks need to be mitigated. First, communities may not agree to ceding their land for rehabilitation, especially where mangrove ecosystems have been converted to alternative uses. An in-depth assessment of rehabilitation areas and consultations with local communities should be conducted before on-the-ground activities commence, to ensure adequate community support and the adoption of appropriate rehabilitation techniques. Second, land tenure may be unclear. This risk will be mitigated by targeting areas where land tenure is not disputed. The project also allocates budget for specific interventions to resolve tenure issues. Third, rehabilitated areas could be degraded after rehabilitation. Mitigating this risk will require continued support from local communities and local governments (which in turn will require that the livelihood and management activities be implemented in a timely manner), strict adherence to the Mangrove Rehabilitation Guidelines in the OM and through the sustained engagement of local actors and local governments. Fourth, the suitability of rehabilitation areas and the final determination of target areas will only be known during project implementation. Mitigating this risk will require continued dialogue with counterparts and stakeholders to manage expectations and the review of project targets at mid-term.

90. Institutional Capacity Risk (High). The MoEF and BRGM have limited experience with World Bank–financed projects, CMMIA is a new implementing agency with limited experience in managing funds directly, and IEF is a relatively new Public Service Agency under the MoF. Mitigation measures to reduce institutional capacity risks include: (a) dedicated technical assistance and capacity building to MoEF, BRGM, CMMIA and IEF, including through ongoing technical assistance under the SLMP; (b) support to the GoI in hiring staff familiar with World Bank–financed projects, (c) frequent trainings of the PIUs, and (d) frequent Bank implementation support missions. This risk is expected to remain high at

least in the first year of implementation. Another risk is that the mandate of BRGM will end in 2024 and the transfer of BRGM's functions under this project to MoEF may disrupt project implementation. During the first year of the project, MoEF will prepare a strategy detailing the handling of this transfer to ensure the MoEF PIU's effective and continuous implementation of activities. Several other measures will be taken to ensure a smooth transition, including a dated legal covenant for an Exit Strategy by BRGM and the enactment of necessary regulations and procedures for the transfer of BRGM activities to MoEF.

91. Fiduciary Risk (Substantial). The fiduciary risks and the corresponding risk management measures are discussed in the Appraisal Summary section and in Annex 1. Risk management measures include early and regular training of the PMO and the PIUs; the hiring of experts in the PMO and the PIUs; and frequent, close supervision in the field. A Ministry of Finance regulation will be issued to regulate the budgeting and fund flow arrangements from the government's Treasury account to the IEF and from the IEF to the PIUs. Fiduciary procedures to be followed by the project will be outlined in the OM.

92. Environmental and Social Risk (Substantial). Environmental risks relating to the implementation/minor construction stage are temporary and can be managed using standard mitigation and prevention techniques and practices. Social risks include the high opportunity costs from current land use, the presence of illegal land use in national protected areas, the need for compensation, the lack of availability of commensurate livelihood alternatives, access to future benefits from mangrove rehabilitation, distrust in government, and the difficulty in providing community access to benefits from carbon finance. To mitigate these risks, the GoI has prepared risk management instruments (an ESMF, a Process Framework, a Resettlement Policy Framework, and an IPPF). Screening of areas to be rehabilitated will include land tenure criteria to ensure that activities are implemented in areas that are not at risk of land conflict. A detailed assessment of the environmental and social risks is presented in the Environmental and Social Review Summaries.

93. Stakeholder Risk (Substantial). There is a risk of insufficient stakeholder buy-in and conflicts relating to land and access, particularly among coastal communities in degraded and converted areas, where myriad social barriers to mangrove rehabilitation and conservation exist and productive activities may be taking place. To mitigate these risks, the project will implement the actions in the SEP to ensure robust engagement with all stakeholders. Livelihood activities, including cash-for-work, will prioritize communities that may be adversely affected by the rehabilitation and conservation activities. To address this risk, the GoI and the Bank Task Team will continue to engage with NGOs to clarify the goals of the project and address stakeholder concerns. NGOs may be involved in project implementation to increase delivery capacity and their stake in the project.

VII. RESULTS FRAMEWORK AND MONITORING

Results Framework
COUNTRY: Indonesia
Mangroves for Coastal Resilience Project

Project Development Objectives(s)

To enhance the management of mangroves and livelihoods of local communities in selected areas

Project Development Objective Indicators

Indicator Name	PBC	Baseline	Intermediate Targets				End Target
			1	2	3	4	
To enhance the management of mangroves and the livelihoods of local communities in selected areas							
Policy framework for mangrove management improved (score) (Number)		0.00	0.00	1.00	3.00	3.00	5.00
Mangrove area rehabilitated and managed (Hectare(Ha))	PBC 3	0.00	0.00	0.00	7,800.00	30,000.00	45,000.00
People using sustainable livelihood activities supported by the project (Number)		0.00	0.00	0.00	4,387.00		9,749.00
Percentage of which are women (Percentage)		0.00					30.00

Intermediate Results Indicators by Components

Indicator Name	PBC	Baseline	Intermediate Targets				End Target
			1	2	3	4	
Strengthening Policy and Institutions for Mangrove Management							
Readiness requirements for a blue carbon program are met according to internationally recognized standards (Number)		0.00	0.00	1.00	2.00	4.00	4.00
Updated National Mangrove Map operational (score) (Number)		0.00	0.00	1.00	2.00	3.00	3.00
Multi-sectoral mangrove coordination bodies operational at national and subnational level (Number)		0.00	1.00	3.00	5.00	5.00	5.00
Rehabilitating and Promoting Sustainable Mangrove Management							
Mangrove area under rehabilitation and management (Hectare(Ha))	PBC 2	0.00	13,000.00	50,000.00	75,000.00	75,000.00	75,000.00
Subnational mangrove management plans submitted for approval and adopted (Number)	PBC 4	0.00	0.00	0.00	1.00	2.00	4.00
People participating in cash-for-work activities supported by the project (Number)		0.00	2,850.00	9,975.00	19,950.00	25,650.00	28,500.00
Percentage of which are women (Percentage)		0.00					50.00
Percentage of villages that integrate mangrove		0.00	0.00	0.00	0.00	30.00	50.00

Indicator Name	PBC	Baseline	Intermediate Targets				End Target
			1	2	3	4	
management into village plans (Percentage)							
Net greenhouse gas emissions reductions and removals (ERR) from mangrove rehabilitation and management (Metric ton)		0.00			2,920,000.00	4,998,000.00	7,601,000.00
Improving Livelihood Opportunities for Mangrove Communities							
People with increased knowledge and skills on sustainable livelihoods activities (Number)		0.00	0.00	2,040.00	7,140.00	10,200.00	10,200.00
Percentage of which are women (Percentage)		0.00					30.00
Percentage of approved business plans which are completed (Percentage)		0.00	0.00	0.00	0.00	40.00	80.00
Share of producers and small business owners technically and financially supported by the project who are female (Percentage)		0.00	0.00		30.00		30.00
Share of beneficiaries satisfied with the project's engagement and planning processes (Percentage)		0.00			80.00		80.00

Monitoring & Evaluation Plan: PDO Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Policy framework for mangrove management improved (score)	This indicator measures improvement in the policy framework, based on the sum of scores of the following three criteria: 1) Government regulation on mangrove management drafted (0.5) and submitted for approval (0.5); 2) National Mangrove Program drafted (0.5) and submitted for approval (0.5); 3) Subnational government regulations on mangrove management drafted (0.5 each) and submitted for approval (0.5 each). Total target of 3 sub-national regulations.	Annual (cumulative)	Official government documents	Review of official government documents	MoEF
Mangrove area rehabilitated and managed	This indicator measures mangrove area successfully rehabilitated and/or enhanced and having achieved the following 18 months from the baseline: Mangrove areas where rehabilitation has taken	Annual (cumulative)	Field monitoring reports	The indicator is assessed by annual site inspections using a monitoring methodology to be determined in technical guidelines which will be part of the	MoEF and BRGM

	place will have achieved increase in stem density of at least 1700 saplings/ha or at least 800 seedlings/ha in the case of silvofishery techniques. Mangrove areas where enhancement has taken place will have achieved increase in stem density of at least 500 saplings/ha.			Operations Manual.	
People using sustainable livelihood activities supported by the project	This indicator measures the number of people among project beneficiaries who report using sustainable livelihood activities. The definitions of eligible activities are clarified in the Operations Manual.	Biennial (cumulative). Indicator measured at baseline, mid-term and completion.	Survey of target beneficiaries and field-based observations in target communities.	Review of survey results, triangulation with field observations, and disaggregation by gender and by type of livelihoods sector/activity.	BRGM and MoEF
Percentage of which are women					

Monitoring & Evaluation Plan: Intermediate Results Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Readiness requirements for a blue carbon program are met according to	This indicator measures the achievement of four	Annual (cumulativ	Official documentati	Review of official documentation and	CMMIA

internationally recognized standards	readiness criteria: (1) existence of a reference emissions level for the program area (2) existence of a framework to monitor on mangrove cover change, (3) existence of a benefit sharing mechanism, (4) preparation of a program design document in accordance with an internationally recognized standard.	e)	on and supervision	systems	
Updated National Mangrove Map operational (score)	This indicator measures the operationalization of the updated National Mangrove Map (PMN) based on the sum of scores of the following three steps: 1) updated information from the Project integrated into the PMN; 2) updated PMN reviewed and submitted for formalization by the relevant authorities; 3) PMN made publicly available.	Annual (cumulative)	Official records and review of PMN	Review of official records and PMN	MoEF
Multi-sectoral mangrove coordination bodies operational at national and subnational level	This indicator measures the number of mangrove coordination bodies at the national and subnational levels that are operational	Annual (cumulative)	Official documents and meetings records	Review of official documents and meetings records	MoEF, CMMIA & Provincial Governments

	and functioning. A body will be considered operational if it fulfills these four criteria: 1) Has clear ToR / internal document; 2) Meets at least two times a year; 3) Prepares an annual report on the state of mangroves; 4) Government decree officially establishing the body adopted.				
Mangrove area under rehabilitation and management	This indicator measures the area where mangrove rehabilitation has taken place at site level through the application of a recognized rehabilitation technique, as per the guidelines contained in the Operations Manual.	Annual (cumulative)	Field monitoring reports	The indicator is assessed by reviewing appraised and approved rehabilitation designs, verifying the implementation of designs and direct site inspection.	BRGM
Subnational mangrove management plans submitted for approval and adopted	This indicator measures the approval and adoption of subnational management plans by the relevant provincial authority. The ways in which submission for approval and adoption can be evidenced is detailed in the Operations Manual.	Annual (cumulative)	Official documentation of formal submission for approval and adoption of each management plan	Review of official documentation of submission for approval and adoption of each management plan	MoEF

People participating in cash-for-work activities supported by the project	This indicator measures the number of people participating in project supported cash-for-work activities.	Annual (cumulative)	Cash-for-work registration reports	Review of cash-for-work registration reports	BRGM
Percentage of which are women					
Percentage of villages that integrate mangrove management into village plans	This indicator measures the percentage of Mangrove Stewardship Villages whose mangrove management plans have been integrated into village plans. The Operations Manual describes ways in which integration can be evidenced.	Annual (cumulative)	Field reports and village documents	Review of field reports and village documents	BRGM
Net greenhouse gas emissions reductions and removals (ERR) from mangrove rehabilitation and management	This indicator measures greenhouse gas (GHG) emission reductions and removals resultant from mangrove rehabilitation and reduced deforestation from mangrove management activities under the project.	Annual (cumulative)	Calculations based on mangrove and carbon monitoring	Reductions and removals will be calculated and assessed through site level monitoring activities and will use internationally recognized protocols. Details of the methodology will be included in the Operations Manual.	BRGM and MoEF

People with increased knowledge and skills on sustainable livelihoods activities	This indicator measures the number of people trained through the project who achieve desired learning outcomes. 'Increased knowledge and skills' means they have attended a training under Component 3 and have achieved a 'pass' score on post-training tests (>80%).	Annual (cumulative)	Post-training questionnaire	Review of results of post-training questionnaire	BRGM
Percentage of which are women					
Percentage of approved business plans which are completed	This indicator measures the percentage of business plans completed out of all those awarded.	Annual (cumulative)	Business grant facility database	Review and verification of business grant facility database	BRGM
Share of producers and small business owners technically and financially supported by the project who are female	This indicator measures the percentage of women beneficiaries as a total of those trained in improved practices under 3.1 or supported by enterprise development matching grants under 3.2.	Biennial (non-cumulative). Measured at mid-term and close of project.	Field surveys and rapid livelihoods assessments	Review of field surveys and rapid livelihoods assessments	BRGM
Share of beneficiaries satisfied with the project's engagement and planning processes	This indicator measures the satisfaction of beneficiaries with their participation in decision-making and the	Biennial (non-cumulative).	Beneficiary satisfaction surveys	Review of beneficiary satisfaction surveys	BRGM

	feedback loop in the project.				

Performance-Based Conditions Matrix

PBC 1	Mangrove area with appraised and approved rehabilitation plans			
Type of PBC	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Output	Yes	Hectare(Ha)	18,000,000.00	4.30
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	0.00			
Year 1 - 5	75,000.00		18,000,000.00	$240 / ha

PBC 2	Mangrove area under rehabilitation and management			
Type of PBC	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Output	Yes	Hectare(Ha)	30,000,000.00	7.16
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	0.00			
Year 1 - 5	75,000.00		30,000,000.00	$400 / ha

PBC 3	Mangrove area rehabilitated and managed			
Type of PBC	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Outcome	Yes	Hectare(Ha)	45,000,000.00	10.74
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	0.00			
Year 1 - 5	45,000,000.00		45,000,000.00	$1000 / ha

PBC 4	Subnational mangrove management plans submitted for approval and adopted			
Type of PBC	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Intermediate Outcome	Yes	Number	7,000,000.00	1.67
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	0.00			
Year 1 - 5	4.00		7,000,000.00	$1,750,000 / plan (i) submitted for approval; AND (ii) adopted

Verification Protocol Table: Performance-Based Conditions

PBC 1	Mangrove area with appraised and approved rehabilitation plans
Description	This PBC measures mangrove areas under rehabilitation that have plans appraised and approved by the relevant bodies. The PBC is achieved when MoEF and/or BRGM appraises and approves rehabilitation plans for the selected mangrove area

	rehabilitation sites (scalable by hectares covered under the rehabilitation sites).
Data source/ Agency	BRGM and MOEF
Verification Entity	Independent Verification Agent (to be recruited by the Executing Agency)
Procedure	Each rehabilitation site will have a plan which will detail the number of hectares and other details as specified in the Operations Manual. Approval of rehabilitation plans will be conducted by MoEF and BRGM. The details of the appraisal and approval are in the Operations Manual. BRGM or MoEF will conduct a document review and present evidence of achievement of the result to an IVA. The IVA confirms that the requirements above are met and produces a report that will be submitted for validation by the Bank.
PBC 2	Mangrove area under rehabilitation and management
Description	The PBC measures mangrove area that are under rehabilitation, using a recognized technique, following procedures laid out in the Operations Manual. Rehabilitation must have been carried out according to appraised and approved rehabilitation plans.
Data source/ Agency	MoEF and/or BRGM
Verification Entity	Independent Verification Agent (to be recruited by the Executing Agency)
Procedure	MoEF and/or BRGM will present evidence of results to the IVA for verification, which can include site visits (on a sample basis). Verification report from the IVA will be submitted for review and validation by the Bank.
PBC 3	Mangrove area rehabilitated and managed
Description	This PBC measures the previously degraded and deforested mangrove area that is rehabilitated and/or enhanced and subsequently managed by meeting certain density criteria set forth in the Operations Manual. It would be measured 18 months after initial rehabilitation has taken place. This PBC is scalable.
Data source/ Agency	BRGM and MoEF
Verification Entity	Independent Verification Agent (to be recruited by the Executing Agency)

Procedure	MoEF will present the IVA with monitoring reports from 18 months after rehabilitation. The IVA will review the monitoring reports and confirm that sites have achieved the results, which can include site visits on a sample basis. Verification reports will be submitted for review and validation by the Bank.
PBC 4	Subnational mangrove management plans submitted for approval and adopted
Description	This PBC measures improved mangrove management through the (i) submission of subnational mangrove management plan for approval by a relevant authority at the national, provincial or district level; AND (b) adopted through either (i) an issuance of a provincial or district regulation; (ii) integration of the plan with a provincial or district special plan; or (iii) medium or long-term development plan. Submission for approval is one result; adoption is a second result. Each result is scalable. Up to 4 plans are expected.
Data source/ Agency	BRGM and MoEF
Verification Entity	Independent Verification Agent
Procedure	Independent Verification Agent will review and verify (i) evidence of submission for approval and (ii) evidence of formalization of the plan. Verification report will be submitted for review and validation by the Bank.

Note: IVA = independent verification agents

ANNEX 1: Implementation Arrangements and Support Plan

1. **Project implementation arrangements are embedded in existing institutions**. The MoEF will act as the Executing Agency and will also be an Implementing Agency (IA). The other IAs are the Peatland and Mangrove Restoration Agency (BRGM), the Coordinating Ministry of Maritime Affairs and Investment (CMMIA) and the Indonesian Environment Fund (IEF). The IEF will act as the fund manager.[43] Figure A1.1 provides an overview of the institutional arrangements.

2. **A National Steering Committee (NSC) will be established** to provide strategic guidance on project implementation. It will include members from MoEF, BRGM, the Ministry of Marine Affairs and Fisheries (MMAF), the Ministry of Finance, the Ministry of Home Affairs, the Ministry of Villages, and the Ministry of National Development Planning (Bappenas). It will be chaired by the Coordinating Ministry of Maritime Affairs and Investment (CMMIA) and meet at least twice a year.

3. **The MoEF will execute the project through a Project Management Office (PMO)** housed at the Directorate General of Watershed Management and Forest Rehabilitation (DG PDASRH). The PMO will ensure that the project is implemented in line with its design and the legal agreements governing it. To do so, it will submit annual project work plans, budgets, and required reports (for example, monitoring, safeguards, fiduciary reports) and will consolidate inputs from the implementing agencies.

4. **The project will be implemented through three PIUs, housed at MoEF, BRGM and CMMIA.** The PIU at MoEF will be responsible for activities under Components 1.1, 1.2., 1.3 and 4, and will be led by the Secretary of DG PDASRH. The PIU at BRGM will be responsible for activities under Components 2 and 3, and will be led by the Secretary of BRGM. The PIU at CMMIA will lead Component 1.4. IEF will be responsible for administering project funds and carrying out some procurement. The PIUs will include teams of administrative and technical specialists as well as consultants, who will assist in the design, execution, supervision, and monitoring of project components. The OM will reflect details of the required personnel.

5. **Based on Presidential Regulation No.120/2020, BRGM's mandate will expire in December 2024 and MoEF will take over BRGM's project responsibilities from then on**. During the first year of the project, MoEF and BRGM will prepare an 'exit strategy' detailing the handling of this transfer.

6. **BRGM will implement local-level activities under Components 2 and 3, in collaboration with MoEF**. Activities that take place within forest estates (*Kawasan hutan*) will be coordinated with MoEF's Provincial Representation Office (UPT/Balai); activities in non-forest areas will be implemented by BRGM, in collaboration with subnational governments and/or NGOs.

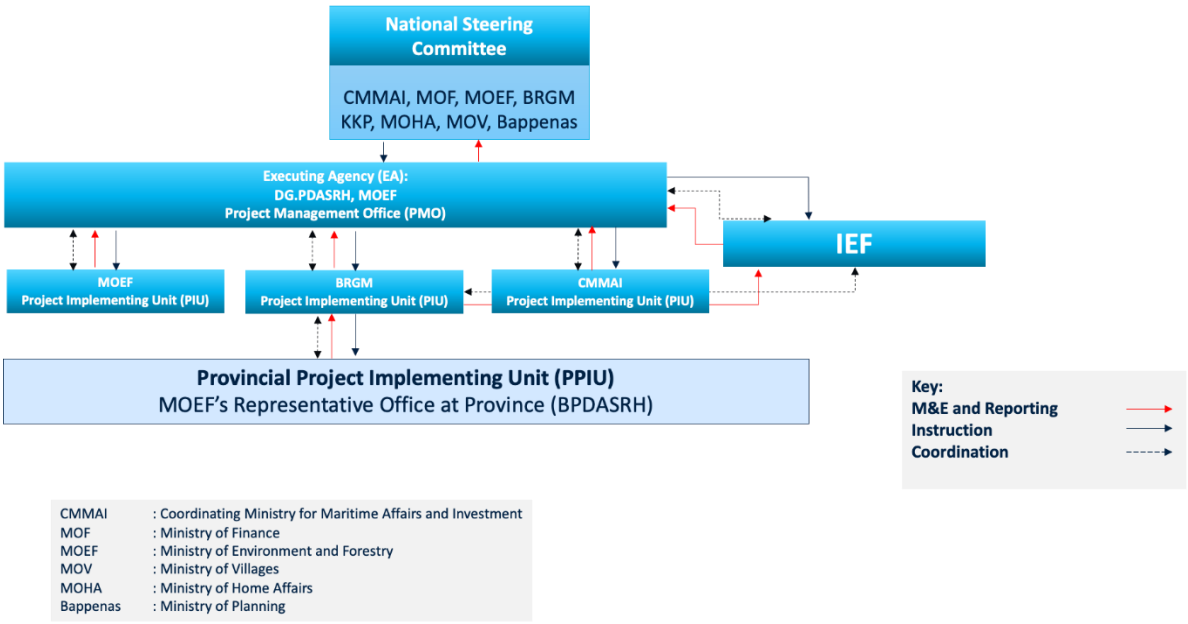
7. **Provincial Project Implementation Units (PPIUs) will be established in each target province**, under MOEF's Provincial Representation Office (UPT/Balai), to support the implementation of project activities implemented by different agencies (sub-national office/dinas, NGOs, etc.). The PPIUs will coordinate with the

[43] The costs associated with IEF's role as fund manager will be covered by the grant funding from the Sustainable Landscape Management Program (SLMP) Multi-Donor Trust Fund (MDTF).

PIU at BRGM on the technical aspects and with IEF on funds utilization. The OM will detail the roles and responsibilities of the PPIUs.

8. **CMMIA will lead Component 1.4: Preparation of Mangrove Blue Carbon Offset Readiness.** CMMIA will conduct studies, support cross-sectoral coordination, and lead policy work to leverage payments for blue carbon. It will work closely with MoEF, BRGM and other ministries, including the Ministry of Marine Affairs and Fisheries which has a mandate to monitor blue carbon.

Figure A1.1. M4CR Institutional Arrangements



9. **The IEF will administer project funds.** It is a Public Service Agency (*Badan Layanan Umum [BLU]*) under MoF. It will coordinate with MoF to withdraw funds from the Treasury general account of MoF (*Rekening Kas Umum Negara* [RKUN]), disburse funds to the PMO, the PIUs, and the PPIUs, and implement some procurement activities. The IEF will reduce the administrative burden on the PIUs and support the PMO in consolidating financial reporting from the PIUs and the PPIUs.

10. **The Borrower will prepare a OM detailing project implementation arrangements, fiduciary and safeguard rules, and technical details**. The OM will be a dated legal covenant.

11. **Financial Management.** The following legal agreements will be signed:

- **Loan agreement.** The loan agreement will be signed by the MoF (on behalf of the GoI). The MoF will issue a Minister of Finance Regulation (*Peraturan Menteri Keuangan [PMK]*) on the Management of the Mangrove Rehabilitation and Conservation program, which provides a legal basis for the implementation, budgeting, and fund flow arrangements. The issuance of the PMK,

satisfactory to the World Bank, will be a condition of effectiveness.

- **Grant agreement.** A grant agreement will be signed by the IEF (on behalf of the GoI) covering for the funds from the Sustainable Landscape Management (SLM) Multi-Donor Trust Fund and the Oceans Multi-Donor Trust Fund. PMK 124/2020 on the procedure for environmental fund management provides authority to the IEF to sign a grant agreement with a donor, and the Bank has previously signed a grant with the IEF. This arrangement will streamline the fund flow and budgeting process for project implementation.

12. **A summary of financial management arrangements is provided below.** The OM will provide detailed guidance on financial management and disbursement arrangements in accordance with the World Bank's requirements and the Mangrove PMK.

13. **Budgeting.** All loan activities will be integrated into the central government budget documents. Based on the agreed annual work plan, MoF will allocate budget to IEF that will further channel the fund and record the allocation in the budget document of the respective budget holders (IEF, MoEF and BRGM). This mechanism will be stipulated in the new PMK on the Management of the Mangrove Rehabilitation and Conservation program mentioned above. For activities planned in 2022, MoF allocated the budget prior to loan/grant negotiations. The budgeting arrangement for the grant will follow the existing government procedures for BLUs. Once the detailed budget breakdown is agreed with the World Bank, it will be integrated into the IEF budget document that is part of the central government budget documents of MoF DG Treasury.

14. **Internal Control.** All implementing agencies are central government agencies that follow the Government Internal Control System for the public sector, which has adopted the Committee of Sponsoring Organizations of the Treadway Commission (COSO) framework.[44] The Government Internal Control System is formalized through a series of MoF regulations as the system for implementation of State Treasury Law No. 1, FY2004. It is considered adequate to support World Bank–funded operations. Ministry of Finance Regulation PMK 124/2020 on the procedure for environmental fund management also provides a control mechanism on fund transfer and accountability from the IEF to other government agencies, NGOs, and community groups. The OM will detail additional internal control arrangements, including the roles and responsibilities of the executing agency/PMO, PIUs, PPIUs, and the fund administrator as well as arrangements for planning, budgeting, fund flow, payment, accountability, financial reporting, matching grants, audits, and a verification protocol for disbursement against PBCs.

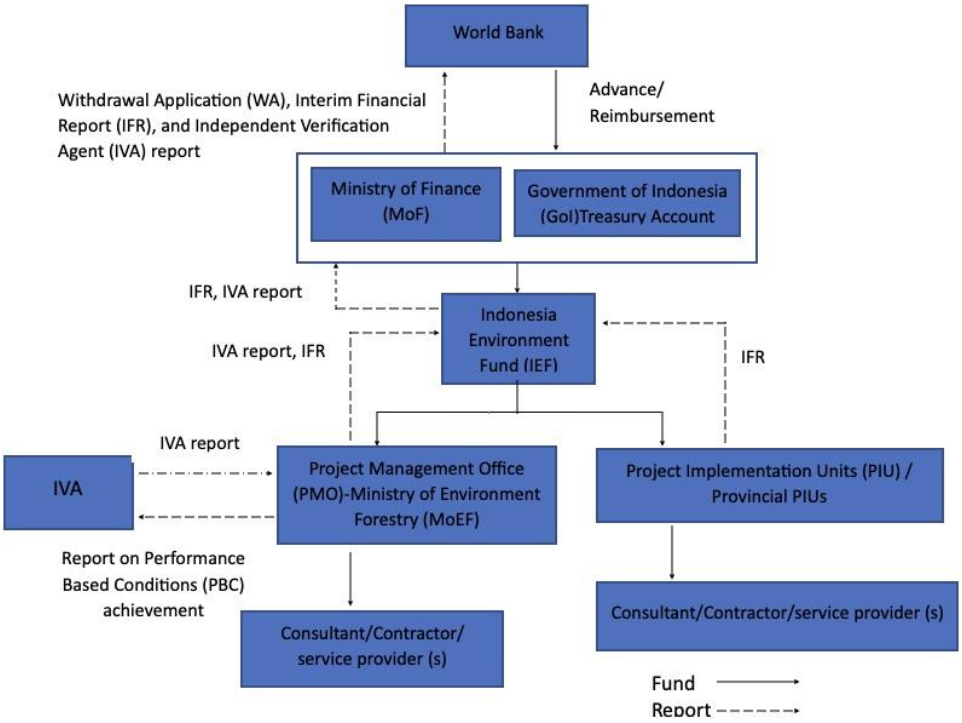
15. **Accounting and Reporting.** Project implementation will follow the Government Accounting System. The IEF will be responsible for supporting the executing agency in consolidating the financial reports from all implementing units and developing interim and annual financial reports. Quarterly Interim Financial Reports (IFRs), in a form agreed with the Bank, will be submitted to the Bank no later than 45 days after the end of each quarter and should consist of a list of payments for contracts under the World Bank's prior review, a

[44] "The Committee of Sponsoring Organizations of the Treadway Commission (COSO) is a joint initiative of five professional organizations and is dedicated to helping organizations improve performance by developing thought leadership that enhances internal control, risk management, governance and fraud deterrence" (https://www.coso.org/Pages/default.aspx). In 2004, it published the Enterprise Risk Management Integrated Framework to help organizations manage risk.

statement of expenditures for all other expenses, and projected expenditures for the next six months.

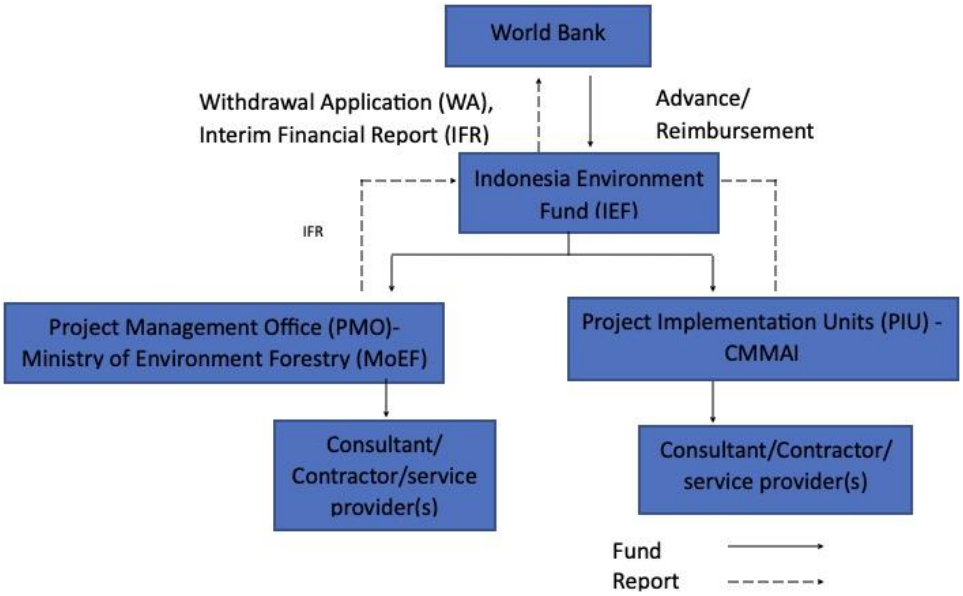
16. **Funds Flow of the Loan:** World Bank funds will flow based on the documentation of eligible expenditures incurred and the achievement of PBCs. The Bank may advance funds to a pooled account at the GoI Treasury general account at the central bank to finance eligible expenditures based on a six-month forecast. The MoF will transfer funds from the GoI Treasury account to IEF, which will channel the funds to the implementing units or directly to third parties to execute activities based on an agreed work plan. The MoF will replenish the pooled account or request reimbursement based on a withdrawal application (WA) and the IFR submitted by the executing agency. A report by an independent verification agency will be added if the funds are linked to PBCs. The DG Treasury of the MoF will sign the withdrawal application to the World Bank. Figure A1.2 shows the flow of funds for loan components.

Figure A1.2. Flow of funds for Loan Components



17. **Funds Flow of the Grants:** Bank grant funds will be transferred directly to a separate pooled designated account in US dollar established by IEF at a commercial bank to finance eligible expenditures from the two SLM and OMDCR grants. The IEF will channel the funds to implementing units or directly to third parties to implement activities based on an agreed work plan in accordance with PMK 124/2020 on the procedure for environmental fund management. Additional transfers from the World Bank can be made based on a withdrawal application and a request using the IFR format, which includes the projection of project needs for the six-month period. The IEF will sign the withdrawal application. Figure A1.3 presents the fund flow arrangement for the grants.

Figure A1.3. Funds Flow arrangement for the Grants



18. **Independent Verification Arrangements.** The executing agency will hire a private, independent, third-party verification agent (IVA) for PBCs 1-4, which it will pay for from the loan proceeds. The MoF will provide a sufficient budget for the IVA to conduct the independent verification tasks. The verification will be conducted semi-annually. The Bank will review and validate the independent verification reports before disbursing funds.

19. **Disbursement Arrangements.** The applicable disbursement methods are advance and reimbursement; direct payment and special commitment are not anticipated under the Project. Eligible expenditures will include goods, works, consulting services, non-consulting services, training/workshops, matching grants, and incremental operating costs. Applications for withdrawal from the **loan** will be made in US dollars to a pooled account in the GoI Treasury account at the central bank, based on the projection of project needs for the six-month period and documentation of eligible expenditures noted in the IFRs. For disbursement categories requiring the achievement of PBCs, the disbursement will also be based on a verification report certifying their achievement. PBCs will be used to finance activities under Subcomponents 2.1 and 2.2 of the projects, with costs to be shared between PBC–based and input-based disbursement, which finance similar types of expenditures covering goods, works, consulting services, non-consulting services, training/workshops, and incremental operating cost. Once a PBC is achieved, some of the expenditures will be reported under the PBC disbursement category, with the amount not to exceed the maximum allocation for that PBC. PBC and non–PBC disbursements are separated to avoid duplicated accounting. Bank disbursements for the PBC-based sub-components will be the lower of either PBC eligible expenditures incurred or the aggregate value of PBCs achieved for the period. In the case of **grants**, a designated account (DA) for the grant, denominated in US dollars, will be opened at a commercial bank agreed with the World Bank. The designated account will be a separate pooled account to receive funds from the two grant sources, with fluctuating ceilings based on a six-monthly forecast. Reports of the use of funds from the designated account and requests for additional advance

will be based on the quarterly IFRs. Separate withdrawal applications are required for each of the two funding sources, but the same set of IFRs will support both types of withdrawal applications. Table A1.1 presents the disbursement categories and allocations for the funds. No retroactive financing or counterpart fund is anticipated under the Program.

Table A1.1. Allocation of Loan Proceeds

Category	Amount of IBRD loan allocated (mil of US$)	Percent of expenditures to be financed (inclusive of taxes)
(1) PBC Eligible Expenditures under Part 2 of the operation.	100	100
(2) Goods, works, non-consulting services, consulting services, training/workshop, matching grant, and incremental operating cost under part 2, 3, and 4 of the operation.	300	100
Total	**400**	

Table A1.2. Allocation of Grant Proceeds

Category	Amount of grant allocated (mil of US$)	Percent of expenditures to be financed (Inclusive of taxes)
Goods, consulting services, non-consulting services, training/workshop, and incremental operating cost of the project to finance Components 1.1, 1.2, 1.3 (SLM Multi-Donor Trust Fund).	15	100
Goods, consulting services, non-consulting services, training/workshop, and incremental operating cost of the project to finance Component 1.4 (Oceans, Marine Debris and Coastal Resources Multi-Donor) Trust Fund.	4	100
Total	**19**	

20. **Audit Arrangements.** The program will be subject to an annual external audit by Indonesia's Supreme Audit Institution, the *Badan Pemeriksa Keuangan (BPK)*. Each audit will cover one fiscal year of the recipient. The audits will be conducted based on the terms of reference agreed with the Bank. Audit reports and audited financial statements will be furnished to the Bank no later than six months after the end of the fiscal year concerned and shall be made available to the public. The audit will provide an opinion on the financial statements and will also include opinions on the internal control frameworks and compliance with the loan and grant covenants and related regulations.

Procurement

21. **Procurement** of works, goods, consulting, and non-consulting services at the central level will be carried out by MoEF, BRGM and IEF. The IEF will be responsible for procurement for Component 1, financed by the

MDTF grant funding. MoEF and BRGM will conduct procurement for Components 2, 3 and 4, financed by the loan.

22. **Key procurement risks and mitigation measures are shown in Table 1.3 below.**

Table A1.3. Procurement Risks and Mitigation Measures

Risk Description	Mitigation Measures
Delays in procurement due to capacity constraints (weak procurement capacity, lack of experience with Bank Procurement Regulations, i.e., IEF, constraints in staffing for procurement and contract management).	• Recruitment of qualified individual procurement consultant with prior experience with World Bank funded projects to support procurement implementation. • Early setting up of an exclusive procurement Pokja for the project, which will accelerate the Government's internal approval of procurement documents. • The Bank will provide training on Procurement Regulations and the use of STEP. • Bank's prior and post review, regular implementation support missions, hands-on operational/fiduciary advice, and guidance.
Low procurement readiness in the first year of the project.	• Enhancement of procurement readiness by mobilizing resources to prepare TORs of critical consultancy services, specifications/draft bid documents of key goods/works packages, training on procurement procedures and STEP before loan/grant effectiveness.
Lack of systematic monitoring and evaluation (M&E) of procurement and contract performance.	• Build a systematic procurement and contract monitoring and evaluation (M&E) system. • Mandatory use of the STEP system for monitoring procurement and contract management.
Improper packaging plan, inappropriate technical requirements/design, and low levels of interest from the market, which may result in bidding failure or low quality of procured goods/works, and low value for money for concerned procurement activities.	• Preparing a Project Procurement Strategy for Development (PPSD) for appropriate procurement packaging arrangements, detailed and realistic procurement schedules, and contract management plan. • Preparing technical specifications/TORs based on market survey and engagement activities.
Lack of support and coordination among the PIUs (IEF, MoEF, BRGM, and CMMIA).	• Frequent meeting and coordination among PIUs (IEF, MoEF, BRGM, and CMMIA).

23. **PPSD Summary and Procurement Plan** - The PPSD has been prepared by the PIUs (MoEF, BRGM, IEF, and CMMIA) with support from the World Bank procurement team. The PPSD includes detailed assessments of the markets for goods, works, non-consulting and consulting services that are required for project implementation, procurement approaches including CDD procurement, and procurement risk analysis along with the corresponding risk mitigation measures. Based on the PPSD conclusions, the PIUs have jointly prepared a Procurement Plan (PP) for the first 18 months of project implementation which was agreed during loan negotiations. The PP is a living document and will be updated at least annually or as required during project implementation to reflect any substantial changes in procurement approaches and methods to meet the

implementation needs, market fluctuations, and improvements in institutional capacity. The updated PP along with the revised PPSD will be subject to the Bank's prior review and approval. The major procurement categories to be financed by the Bank and their implementation arrangements have been assessed in the PPSD. The core activities will involve CDD procurement approaches that will involve procurement of many small-value contracts for goods, non-consulting and/or consulting Services, and a large number of small works scattered in the selected mangrove areas in the provinces covered by the project. The proposed CDD procurement arrangements will be elaborated in the OM approved by the Bank and made publicly available by MoEF.

24. **The Government's Electronic Procurement System (*Sistem Pengadaan Secara Elektronik* [SPSE]** may only be used for the procurement of goods, works and non-consulting services through the Open National Competitive Procurement and using the bid documents acceptable to the Bank. The SPSE International Competitive Bidding (ICB) e-procurement system modified by LKPP may be used only for the selection of consultant firms under the QCBS method and using the Bank's standard Request for Proposal document adjusted for electronic use in a manner satisfactory to the Bank. Procurement under all other methods including Open International Competitive Procurement shall be carried out through a non-electronic process with manual issuance of invitation for bids and receipt of bids/proposals, until such time that the modification of the LKPP's modified SPSE ICB e-procurement system has been completed by LKPP in a manner acceptable to the Bank, which will be confirmed through the Bank's written no objection.

25. **Procurement under the project is expected to be** low value and low in complexity, below the Bank's post-review threshold and will be procured through Open National Competitive Procurement. The National bid document can be used when approaching the national market and CDD procurement may be used for low-value contracts, as they do not conflict with the Bank's procurement regulations and the required improvements listed in the Procurement Plan, which are incorporated in the model bidding documents agreed between the World Bank and the National Public Procurement Agency (*Lembaga Kebijakan Pengadaan Barang/Jasa Pemerintah* [LKPP]). In case of a conflict or a difference in opinion during the procurement process, the Bank will provide clarification in writing for the application to be followed.

Implementation Support Plan

26. **Joint Implementation Support**. The World Bank and the GoI will conduct implementation support missions at least twice a year, and more often in the first two years of project implementation. These missions will include field visits to the targeted sites, complemented by several thematic supervision and technical missions. Formal missions will be complemented by the issuance of an Aide-Memoire and Management Letter. Findings, recommendations, and agreed decisions in the Aide-Memoires will be used jointly by the GoI and the Bank team to improve project implementation.

27. **The World Bank will maintain a core team based in Jakarta and Washington, consisting of specialists in environmental and social management, social aspects, financial management, procurement, social and environmental safeguards, and M&E**. The team based in Jakarta will maintain frequent and intensive coordination and collaboration with the GoI, particularly with MoEF, BRGM, CMMIA MoF and IEF. Whenever required, the core team will be supplemented by technical experts on economics, environment/forestry management and policy, community investment development, capacity development, blue carbon, and other

areas, particularly to provide just-in-time advisory services. The team will collaborate with other relevant sectoral specialists, including Bank experts on social sustainability and inclusion; finance, competitiveness, and innovation; climate change; and land management. Table A1.4 shows the level of support that will be available during project implementation.

Table A1.4. Implementation Support Plan: Estimate of Skills and Resources Needed

Focus	Specialist	Estimated annual resources
Overall guidance, project management and supervision	Task Team Leader	Six to eight staff weeks, two missions, site visit as needed
Technical supervision (policy/ institutions)	Policy Specialist	Four to six staff weeks, two missions, site visit as needed
Technical supervision (mangrove/forestry specialist)	Mangrove/Forestry Specialist	Four to six staff weeks, two missions, site visit as needed
Technical supervision (community-based investment development)	Social Development/Community Investment Development Specialist	Four to six staff weeks, two missions, site visit as needed
Technical supervision (blue carbon)	Blue Carbon Specialist	Four staff weeks, site visits as needed
Technical supervision (implementation)	Operations Specialist	Six staff weeks, two missions, site visit as needed
Financial management, disbursement arrangements, training and supervision	Financial Management Specialist	Three to four staff weeks, two missions, site visit as needed
Procurement training and supervision	Procurement Specialist	Three to four staff weeks, two missions, site visits as needed
Environment risk management, training, and monitoring	Environmental Risk Management Specialist	Four to six staff weeks, two missions, site visit as needed
Social risk management, training, and monitoring	Social Risk Management Specialist	Six to eight staff weeks, two missions, site visit as needed
Monitoring and evaluation implementation support	M&E Specialist	Two to three staff weeks, two missions, site visits as needed

28. **In addition to World Bank budget for supervision, Bank-executed trust fund will also be available** through the SLM MDTF and the Oceans MDTF to provide continued technical assistance to the project.

ANNEX 2: Detailed Project Description

Component 1. Strengthening Policy and Institutions for Mangrove Management (Grant: US$19 million)

1. **Component 1 aims to strengthen policies and institutions in order to improve the management and financing of mangroves.** It will finance training, workshops and meetings, human resources, consultancy, non-consultancy services, operational costs, and goods and equipment.

Subcomponent 1.1. Strengthening Policy, Governance and Coordination (SLM MDTF: US$4 million. Led by MoEF).

2. **Subcomponent 1.1 will strengthen policy and coordination among mangrove stakeholders and improve knowledge management and sharing.** Activities to be supported include (i) development of regulations for sustainable mangrove management; (ii) mainstreaming the sustainable management of mangrove at the subnational level by supporting the development of subnational regulations (*Perda/Pergub/Perbup*). Activities will initially focus on four priority provinces; (iii) enhancement of national and subnational cross-sectoral coordination on mangrove management by government agencies and other stakeholders by supporting the national and subnational coordination bodies (for example, the National Mangrove Working Group (POKJA), the provincial-level Mangrove Rehabilitation Teams (*Kelompok Kerja Mangrove Daerah* [KKMD]). Since the development of KKMD will require several regulations, the project will provide interim support to the Regional Mangroves Rehabilitation Team (Tim Restorasi Mangrove Daerah [TRMD]) in target provinces; (iv) enhancing the capacity of mangrove-related stakeholders through knowledge and best-practice exchanges with other countries and domestic experiences; (v) promoting strategic communications on mangrove management; and (vi) analytics and policy dialogue related to mangrove management, such as impact of mangroves rehabilitation and management on Indonesia's NDC and FOLU Net Sink target, and on land tenure issues in mangrove areas, including land tenure assessments, the creation of a sub-working group on tenure within the National Mangrove Working Group, and supporting the integration of mangrove areas into spatial plans, particularly into the provincial- or district-level spatial plans (*Rencana Tata Ruang Wilayah* [RTRW]).

Subcomponent 1.2. Improving and Updating the National Mangrove Map (PMN) (SLM MDTF: US$4.7 million. Led by MoEF)

3. **Subcomponent 1.2 will support the improvement and updating of the National Mangrove Map and establish a spatial data portal to make mangrove information widely accessible.** The PMN is part of Indonesia's OneMap policy.[45] It was launched in 2021 to ensure the dissemination of data on mangrove ecosystems, such as condition and trends in cover. The PMN identifies areas that have been deforested and are exposed to climate risks and hence need rehabilitation. It lacks some functionalities, including a data portal to record mangrove rehabilitation and conservation conducted by stakeholders (individuals, communities, subnational government,

[45] Indonesia's OneMap divided roles and responsibilities among ministries to develop thematic geospatial information (*Informasi Geospasial Tematik* [IGT]) and act as the data custodian for specific issues. The MoEF was appointed data custodian for several IGTs, including forest cover, forest area, forest licenses, peatland, and mangroves. The MoEF was appointed data custodian for several thematic data, including forest cover, forest area, forest licenses, peatland, and mangroves. This project directly supports implementation of the OneMap policy.

central government, the private sector), and it needs to be updated regularly. This subcomponent will support the following activities:

i. **Identification and inventory of mangrove data, specifically biophysical and socioeconomic parameters** that can be mapped and are important for the management of Indonesia's mangrove ecosystem. These parameters include identifying and inventorying parameters, the methods used to map parameters, data sources, training data requirements, computational considerations, update frequency, and derived management information.
ii. **Design and implementation of a web-based spatial data portal to improve the quality of mangrove data.** This portal will include information on biophysical (including carbon) and socioeconomic variables. This activity will finance (i) storage of data, (ii) enterprise security, (iii) capture and management of training data used to validate models, (iv) data capture and mapping capabilities, (v) workflow engine for system orchestration and automation, (vi) capacity building required to manage the system, and (vii) metadata and ancillary information for products that include validation results.
iii. **Institutional capacity building and infrastructure for mapping mangroves.** This activity will include (i) assessment of different mapping paradigms including local processing, containerized processing, cloud processing, and service-based processing; (ii) provision of the software, hardware and equipment required to support the development and operationalization of mapping products; and (iii) capacity building to support mapping operations.
iv. **Generation and dissemination of data and mapping products.** Mangrove data and the National Mangrove Map will be updated building on the activities above and disseminated. The map will also be updated based on additional data from stakeholders, training, and satellite images.

Subcomponent 1.3. Registration and Monitoring of Mangrove Rehabilitation and Sustainable Mangrove Management (SLM MDTF: US$6.3 million. Led by MoEF)

The project will support the development of a mangrove rehabilitation and sustainable landscape management monitoring system to track progress in implementing the National Mangrove Program, including this project. Data collected through the monitoring system will be used to track changes in mangrove extent, coverage, and health that will inform mangrove-related calculations (including carbon) and decision making. Activities will include (i) the design and implementation of a monitoring system (data storage, data collection, orchestration, data visualization and reporting, analytics, and external data connections); (ii) design and establishment of a mangrove sampling network with permanent plots that can be used for multiple purposes, such as remote-sensing image calibration, calibration and validation of biomass estimation algorithms, biophysical and socioeconomic parameters, and support of vegetation dynamic studies; (iii) development of a comprehensive methodology for mangrove monitoring, including field methods, equipment requirements, analytical requirements and methods, and auditing requirements; (iv) updating of the national registry system to include mangroves; (v) clarification of the governance mechanism of the mangrove monitoring system; (vi) integration of the monitoring system into the National Mangrove Program; and (vii) operationalization of a mangrove information dashboard, a decision-support system that will translate data from line ministries' systems into indicators and visual tools to assist in managing and coordinating the National Mangrove Program.

Subcomponent 1.4. Preparation of Mangrove Blue Carbon Offset Readiness (Oceans MDTF: US$4 million. Led by CMMIA)

4. **The project will support Indonesia's readiness to access finance for blue carbon,** which could help Indonesia meet its NDC commitment and other emission-reduction goals. Blue carbon payments could mobilize funds for the rehabilitation and protection of mangroves and create economic incentives to reduce rates of mangrove deforestation. This component will complement and build on Subcomponents 1.2 and 1.3, with carbon measurements using the same sites established for mangrove monitoring. Carbon emissions reductions from M4CR investments are estimated to be almost 50 million tCO_2e over 30 years and approximately 4.8 million tCO_2e over the five-year project lifetime.

5. **The project will support bringing the emissions reductions generated under M4CR's investments to market by developing a blue carbon program for the project area that is eligible for payments, designed according to internationally recognized standards.**[40] One province will be designated for the piloting of blue carbon readiness activities, as a basis for scale up to other provinces. Activities will include (i) conducting analysis and research on carbon economic valuation of mangroves; (ii) developing a blue carbon emissions reduction measuring and reporting framework; (iii) measuring and reporting baselines for assessing mangrove carbon stocks and fluxes; (iv) measuring and reporting carbon emission reductions from project implementation; (v) integrating results from (iii) and (iv) into a system for mangrove carbon monitoring, reporting, and verification and a mangrove carbon registry; (vi) clarifying carbon rights and land tenure, carbon regulation frameworks for transfer of emission reductions, links with nationally determined contribution reporting, sub-agreement and benefit-sharing principles and they ways in which resources would be managed (for example, payments distribution arrangements); (vii) conducting consultations, developing a benefit-sharing plan, and creating grievance redress mechanisms; (viii) examining market options and benefit–cost analysis of scenarios, identifying potential buyers/financiers, and supporting GoI to meet buyers/financiers' requirements, including development of a project design document; and (ix) building government capacity to be ready to access blue carbon finance.

Component 2. Rehabilitating and Promoting Sustainable Mangrove Management (IBRD: US$300 million)

6. **Component 2 will finance large-scale community-led mangrove rehabilitation and the sustainable management of mangroves.** This component aims to enhance mangrove ecosystem functions by rehabilitating mangroves and preventing deforestation and degradation of existing and rehabilitated mangrove forests by promoting sustainable mangroves management. It will be partially implemented through disbursements against Performance-Based Conditions (IPF-PBC) (up to US$100 million). It will finance labor for mangrove rehabilitation (through a cash-for-work[46] scheme), goods (planting material), equipment, individual and firm consultancies, infrastructure, and operational costs.

7. **Community engagement at the village level is a cross-cutting approach for rehabilitation and mangrove management activities under Component 2, as well as for livelihoods improvement under Component 3.** Community engagement will take place in target villages through the designation of Mangrove Stewardship Villages (*Desa Mandiri Peduli Mangrove* [DMPM]) and, within DMPMs, the formation of field schools – community learning groups in each village who will actively participate in project activities, with the goal of

[46] The cash-for-work program builds on ongoing GoI programs (*padat karya*) that have established clear payment guidelines that this project will adhere to.

providing them with hands-on training. Field schools will be established for mangrove rehabilitation and mangrove management ("mangrove rehabilitation field schools", Component 2.1 and "mangrove management field schools," Component 2.2) and coastal livelihoods ("coastal field schools," Component 3). The highly participatory DMPM approach centers on village stewardship, ownership, and empowerment for sustainable mangrove management. It draws on the model BRGM applies to peatlands.

Subcomponent 2.1. Large-Scale Community-based Mangrove Rehabilitation (IBRD: US$247 million)

8. **Subcomponent 2.1 will finance large-scale community-based mangrove rehabilitation in selected villages in the target provinces.** Rehabilitation will follow a step-by-step approach consisting institutional strengthening at the village level, assessment and selection of rehabilitation areas, training of local facilitators on mangrove restoration, planning and design of mangrove rehabilitation, implementation of mangrove rehabilitation, M&E, and midcourse improvements. The rehabilitation techniques build on global best practices,[47] expanding the usual repertoire of techniques used by the GoI. This subcomponent will cover the operational costs of organizing and training local communities, labor (including cash-for-work) for community-based rehabilitation, goods (planting material), equipment, individual and firm consultancies, and small infrastructure.

9. **The subcomponent will finance the phases of a robust mangrove rehabilitation process, specifically:**

i. **Preparation of mangrove rehabilitation field schools**. Mangrove rehabilitation field schools will be established in each village with the aim to build community skills, knowledge, and critical thinking around mangrove rehabilitation.[48] Field school participants will be selected in coordination with the village government, with women comprising at least half of participants and including poor and vulnerable community members. The subcomponent will finance the development of training curriculum modules for the field schools. A cadre of regional field school trainers will be identified and trained in teaching methods and technical aspects of mangrove rehabilitation and dispatched to conduct field school trainings in the villages. Village facilitators will be selected in each village to coordinate the field schools.

ii. **Implementation of mangrove rehabilitation field schools.** This subcomponent will finance the running costs of the field schools, approximately eight sessions in each village, which includes the stipends of regional trainers and village facilitators, training materials and equipment, and operational costs and logistics.

iii. **Rehabilitation site selection, participatory rehabilitation design, work-planning, development of rehabilitation plans, and appraisal and approval of rehabilitation plans.** Field school participants will assess target mangrove sites against biophysical (for example, surface elevation, hydroperiod, propagule availability, landscape modifications preventing natural secondary succession) and social criteria (for example, access to future benefits of rehabilitation, presence of conflict, tenurial security,

[47] Global best practices recommend community participation and collaboration with government and other stakeholders across the following processes: multidisciplinary rehabilitation opportunity assessment, design, implementation highlighting hydrological repair and ecological rehabilitation, robust monitoring of at least three years, and midcourse corrections based on evaluation.

[48] The mangrove field school approach used in this project organizes community groups, building their capacity in three aspects of mangrove management: rehabilitation, protection, and sustainable utilization. The GoI has used the approach since the 1990s, initially in the agricultural sector. It is effective at building critical thinking skills of participants through weekly learner-centered field-based activities around themes of mutual importance.

forest governance, community interest, and opportunity cost to current land users) and consider land tenure status of the areas, including options to address land tenure insecurity and conflicts. Site selection will be based partly on these assessments. It will be conducted in the target villages, facilitated by the PIUs, and coordinated by the Mangrove Rehabilitation Working Group in each province. Field school participants will then develop village-level mangrove rehabilitation plans. Rehabilitation plans will consist of technical rehabilitation designs (maps and mangrove rehabilitation techniques), work plans, and monitoring plans. Rehabilitation plans will be appraised and approved by the relevant authority according to the procedures in the OM, prior to the start of implementation.

iv. **Implementation of mangrove rehabilitation using recommended techniques through a cash-for-work program:** Rehabilitation activities will be carried out by local community members, facilitated by PIUs and other entities as needed. Rehabilitation will be conducted according to a rehabilitation typology based on global best practices. This typology considers social (for example, land use, tenure, governance, and socioeconomic factors) and ecological features (for example, land cover, geomorphology, biophysical vulnerability) of the target sites. This is detailed in the OM. Site preparation activities (primarily hydrological repair) and planting activities (planting of propagules and seedlings, plantings in silvo-fisheries, natural revegetation, and human-assisted propagule dispersal, among others) will be undertaken primarily with labor and hand tools, using GoI's cash-for-work payment scheme. Global best practice rehabilitation techniques (detailed in the OM) will be employed based on site-specific conditions. Special equipment such as excavators and coastal protection measures may be used, but most of the mangrove rehabilitation is expected to involve direct planting. Additional techniques, such as hydrological rehabilitation, will be piloted based on site requirements and the development of policy allowing the application of new techniques.

v. **Maintenance, monitoring and mid-course corrections of rehabilitated areas:** This subcomponent will finance the maintenance and monitoring of rehabilitated areas by members of local communities for three years. Participatory monitoring will be conducted by community groups and high-quality assurance monitoring by independent entities. Indicators to be monitored include vegetation (cover, growth, diversity) and selected additional indicators (faunal diversity, hydrological development). The subcomponent will finance labor and equipment needed to address failures in rehabilitated areas, such as mortality of planted seedlings or hydrological works. Labor will be paid under the cash-for-work scheme.

Subcomponent 2.2. Sustainable Mangrove Management (IBRD: US$53 million)

10. **Subcomponent 2.2 will support the sustainable management and protection of mangroves in target provinces, at the village and provincial level, in order to prevent ongoing and future mangrove deforestation and degradation.** A few large contiguous mangrove areas will be selected from within four target provinces, based on agreed upon social, economic, ecological, governance, and feasibility criteria.

11. **This subcomponent will finance the following activities at the village level, in all villages:**

i. **Designation and functioning of Mangrove Stewardship Villages (DMPMs):** This subcomponent will facilitate the selection, formation, and functioning of Mangrove Stewardship Villages (DMPMs) through regular meetings of community members and engagement with village leadership in the formal declaration of their village as a DMPM. The selection of villages will be based on proximity to rehabilitation sites (for villages where rehabilitation will take place), as well as proximity to in-tact

mangroves (for villages where rehabilitation will not take place).[49]

ii. **Village-based mangrove management planning and integration into village sustainable development and spatial planning:** The subcomponent will finance facilitators to support village-level planning, as well as the development of mangrove management plans. Initial village mapping will be conducted to develop village profiles (social, economic, ecological and resilience assessment). Participatory land-use planning will be facilitated to inform village spatial planning. Mangrove management plans will outline longer term measures for sustainable mangrove management, which could include the development of village mangrove protection areas and regulations, how mangrove resource access and use rights can be legalized and highlight how activities contribute to climate resilience and mitigation; they will also identify additional financial support from government budgets and programs to ensure the sustainability of these efforts. Villages will be assisted in integrating protection and management activities from these plans into village sustainable development planning and budgeting processes.[50]

iii. **Implementation of mangrove management activities:** This subcomponent will finance village-level management activities in line with the mangrove management plans. Examples include the formation of joint forest patrols; active patrolling; forest monitoring and reporting; conflict resolution; environmental education for youth, including information on the climate benefits of mangroves; teacher trainings, integration into formal school curriculums; and mangrove management awareness campaigns targeting the local population, particularly youth. Villages may also choose to engage in social forestry with relevant technical agencies.

iv. **Conflict resolution.** Where needed, as informed by land tenure assessments in Component 1, conflict resolution measures will be facilitated by certified, national forest conflict resolution specialists. Paralegals will be trained to assist in conflict resolution measures.

12. **The project will use the province as the jurisdictional area of intervention for sustainable mangrove management (subcomponent 2.2).** The following activities will be implemented at the province level in the four target provinces:

i. **Formation and enhancement of multistakeholder forums in target provinces.** Multistakeholder forums will be formed or invigorated as platforms for dialogue on mangrove management in the provinces. Forums will generate, manage and share knowledge relevant to mangroves across stakeholders in the provinces. The subcomponent will finance the activities and operations of the forums, including meetings and field visits.

ii. **Preparation and adoption of subnational mangrove management plans.** This subcomponent will facilitate the preparation of subnational mangrove management plans in each target province. The primary objective of these plans will be to prevent the degradation and deforestation of healthy and rehabilitated mangroves. The plans will be informed by rules and regulations for mangrove management (protection, rehabilitation, and sustainable use) across all forest and non-forest areas. These plans will create a subnational mangrove inventory/baseline, assess drivers of deforestation, and identify actions to address them, including the development of incentive mechanisms such as payment for ecosystem services. The project will support formalizing these subnational mangrove

[49] Selection will consider the Ministry of Villages' Self-Reliant Village Index (*Indeks Desa Mandiri*), which village leadership monitors annually.

[50] The village-level planning processes include sustainable development planning (MUSRENBANGdes, RPJMDes), village budgeting (APBDes), and the development of regulation (SK Desa),

management plans through provincial or district regulations to access continued government support and budgets for long-term management. It will also support integration of the plans with provincial or district spatial plans and medium- or long-term development plans.

Component 3. Improving Livelihood Opportunities for Mangrove Communities (IBRD: US$82 million)

13. **Component 3 aims to improve the livelihoods of local communities in selected areas and promote sustainable enterprises to reduce pressure on mangroves.** This component is closely linked to the mangrove landscape management activities in Component 2 and targets the same villages. The project focuses on improving village-level natural resource management planning, strengthening livelihood activities, and increasing enterprise opportunities, so that coastal communities vulnerable to the impacts of climate change will be better able to cope financially with the impacts of climate change. Activities under Component 3 will also address constraints that women in coastal community face and introduce new approaches and opportunities for inclusive support based on a gender and social inclusion analysis and action planning. This component will finance consultancy services, goods, block grants (access to finance for coastal businesses), and operational costs (including training and workshops). It will be fully implemented through input based IBRD disbursements.

Subcomponent 3.1. Promoting Community-Based Livelihoods (US$18 million)

14. **This subcomponent seeks to promote sustainable, community-based livelihoods activities in target villages.** It will promote the productive activities upon which target villages depend for subsistence and/or incomes and introduce sustainable practices to improve livelihood benefits and/or reduce pressure on mangrove ecosystems. Productive activities will be selected based on village plans developed under Subcomponent 2.1 and rapid local market assessments. They may include capture fisheries, aquaculture, nontimber forest products, coastal agriculture, and tourism. This subcomponent will build directly on the village economic development mapping and planning conducted in all target villages under Subcomponent 2.1 by training and equipping project participants to undertake livelihoods activities consistent with mangrove conservation and rehabilitation plans and village economic development plans.

15. **Through the procurement of goods, consulting services, and operational costs, this subcomponent will finance three activities:**

i. **Rapid assessments of local livelihoods at the village level.** The project will finance rapid assessments of local livelihoods within the target provinces to develop tailored field training manuals for coastal field schools and enterprise skills training activities. The local assessments will (i) identify site-specific sustainable and unsustainable livelihood practices related to the production and processing of selected commodities; (ii) collate village-level plans to identify priority skills training needs to enhance livelihoods and improve natural resource management practices; (iii) assess the economic, social, and environmental viability of priority activities and opportunities for growth; (iv) identify stakeholders, including local producers and market actors; (v) identify gendered aspects of livelihood activities and options to expand the roles acceptable for women to play; (vi) identify linkages to local service providers and experts; (vii) develop tailor-made coastal field school curricula and training modules; (viii) Identify coastal field school trainers (local champions/experts) and map the facilitators who have experience with field schools; and (ix) assess climate risks and/or identify possible disruptions caused by climate change.

ii. **Coastal field schools.** Coastal field schools will consist of seasonal, group-based training sessions that will build critical technical knowledge and skills of producers on managing existing natural resources and improving the livelihood benefits from these resources. Groups of producers (e.g., farmers, fishers, cultivators) will be trained and provided with basic equipment and inputs to improve production in productive activities identified in the village plans that could enhance livelihoods and/or reduce pressure on mangrove ecosystems.[51] Establishment of the field schools will involve curriculum module development and the training of trainers in teaching methodologies and technical aspects of coastal livelihoods. The subcomponent will also finance the running costs of the field schools, which include the stipends for trainers and village facilitators, demonstration plots/equipment and basic packages of inputs for participants (goods such as seeds, fish processing equipment, among others), operational costs and logistics, and technical advisers to support and oversee training activities. The PIU will contract NGOs in the target areas with relevant experience to implement this subcomponent. It is estimated that there will be three to four coastal field schools in each target village, targeting different livelihoods activities and/or social groups.

iii. **Enterprise skills training.** Training under this activity will be delivered as an add-on to commodity-focused coastal field schools, helping prepare producers with the potential to further commercialize their livelihoods to develop basic business literacy skills. The project will train participants on skills and technologies, including business management, processing, packaging, entrepreneurial mindset, and digital payments and marketing platforms. Training modules will be based on skill and knowledge gaps identified in the rapid assessments of local livelihoods. Training will also be extended to service industries, such as eco-tourism and retail. It is expected to strengthen the foundation for enterprise development support activities in Subcomponent 3.2.

16. **Subcomponent 3.1 will take the following steps toward reducing barriers for women to improved coastal livelihood opportunities:** (i) ensure a minimum percentage of all trainers and Coastal Field School facilitators will be women; (ii) Coastal Field School and Enterprise Skills training content and methods will be tailored to the needs of women; and (iii) work with male and female community leaders in male-dominated livelihood activities to overcome barriers to entry for women.

Subcomponent 3.2. Coastal Enterprise Development (US$62 million)

17. **The objective of this subcomponent is to develop and support the growth of sustainable enterprise activities in coastal communities that benefit producers.** The project will provide matching grants that strengthen the linkages between producers and buyers within coastal value chains. The project will finance the following activities:

i. **Market assessments.** This subcomponent will support site-specific market assessments of economic, social, and environmental conditions to identify opportunities and challenges to sustainable value chains. Key outcomes will include the identification of business opportunities, the establishment of eligibility criteria for business proposals, the crafting of outreach strategies to build a strong pipeline of applicants, and identification of local technical advisers and service providers. Based on the findings of the assessments, the project will provide matching grants to support demand-driven value-chain development that contributes to improved and sustainable livelihoods in target villages.

[51] Activities that may improve livelihoods but are inconsistent with mangrove rehabilitation and conservation plans (such as the expansion of aquaculture in mangrove areas) will not be included.

ii. **Coastal enterprise development matching grants.** The project will provide funding to coastal producer groups and/or buyers to fund approved business plans through a competitive process. The goal of the matching grants is to promote the capacity and competitiveness of coastal enterprises, by financing integrated value chain development.
    - *Targeting*: The number and size of matching grants will be determined based on site-specific market assessments. Matching grants will be targeted to demand-driven productive activities, to be specified based on MSME investment interests and village-level economic development plans. A range of grant sizes (approximately $10,000 - $300,000) will be available based on demand and potential. Further details will be elaborated in the OM.
    - *Eligibility and conditions:* Grants will be issued directly to eligible coastal businesses in project target areas, and/or to other value chain actors conditional upon their relationship to and capacity building of target coastal producers. Eligibility for matching grants will be contingent upon criteria to be developed and enshrined in the OM. Considerations will include: (i) a clear economic rationale; (ii) business constitution – appropriate registrations and certifications; (iii) business plans showing how they will maintain or improve status of mangrove ecosystems; (iv) matching requirements; and (v) demonstrated benefits to target beneficiaries in target coastal villages. A negative list of activities will be developed to preclude the use of matching grant funds on harmful activities or activities inconsistent with sustainable management of mangroves. Business plans will be assessed for their individual and collective environmental and social impact.
    - *Implementation*: Matching grants are expected to be managed by a firm hired by the PIU. Key responsibilities of the firm will include (i) implementing awareness raising and outreach activities using digital tools and approaches to build a pipeline of grantees; (ii) managing implementation of matching grants, including the review and selection of business plans; (iii) providing technical assistance to applicants in the design and implementation of their business plans; and (iv) monitoring and reporting on grants. The management of matching grants will strictly enforce controls on business plan approvals and eligibility criteria to maintain or improve the status of mangrove ecosystems. It will use a multi-tranche disbursement schedule in which grant payments are made based on predetermined schedules and conditions. The OM will provide further details on matching grants management and implementation.

iii. **Technical assistance to support coastal communities in preparing and implementing businesses plans and link them with financial services.** The firm managing the matching grants will guide applicants on developing business proposals in line with the matching grants criteria and conditions. These guidelines will focus on ensuring that funded business activities do not increase pressure on fragile ecosystems and are climate informed. The project will also explore digital options for the provision of ongoing technical assistance to build digital skills and records of the grantees and capitalize on cost savings and the scale of digital support delivery. The PIUs will strive to partner with digital platforms and digital financial services providers whose services can contribute to expanded opportunities for coastal enterprises.

18. **Subcomponent 3.2 will take the following steps toward reducing barriers for women to coastal livelihood opportunities:** (i) identify knowledge and skills gaps that prevent women from entering new industries or enterprises through market assessments, and design outreach, training, and technical assistance to address

them; (ii) promote the ability of women to compete for business grants, including through the design of eligibility criteria, awareness of grant facilities, and outreach activities, and technical assistance; and (iii) establish a project partnership with the East Asia and Pacific Gender Innovation Lab to conduct research on the impact of project support to women starting or operating new business activities.

Component 4. Operation Management (IBRD: US$20 million)

19. **This component will support project management and coordination activities to ensure that the project is effectively and efficiently managed to achieve the PDO and in accordance with fiduciary procedures and environment and risk management requirements.** This component will finance the technical and operational costs of the PMO, PIUs at the national and provincial levels, and the IEF. Key activities will include (i) support of communication and stakeholder engagement; (ii) recruitment of technical and administrative personnel (including project coordinators and financial management, procurement, M&E, environment, and social risk management specialists); (iii) monitoring, evaluation, and reporting activities; (iv) safeguards; and (v) fiduciary implementation. It will support other incremental operating costs, including financial audits and procurement of essential goods and office equipment, including ICT needed to support project implementation. It will also finance the establishment of a robust M&E system to document progress and results, including for carbon monitoring and the verification of achievement of PBCs.

ANNEX 3: Climate Co-Benefits and Gender

1. **Climate co-benefits.** Table A3.1 summarizes the climate change adaptation and mitigation co-benefits of each project sub-component.

Table A3.1. Climate co-benefits in M4CR

Component	Adaptation measures	Mitigation measures
Overall approach	• The project is designed using a resilience framework that aims to strengthen the absorptive, adaptive, and transformative capacities of the government, institutions, communities, and individuals to shocks and stresses, including climate change.	• Rehabilitation and protection of mangroves reduce GHG emissions.
Component 1. Strengthening Policy and Institutions for Mangrove Management (Grant: US$19 million)		
	• Not eligible for Co-benefits as this is grant-financed.	• Not eligible for Co-benefits as this is grant-financed.
Component 2. Rehabilitating and Promoting Sustainable Mangrove Management (IBRD: US$300 million)		
Subcomponent 2.1. Large-Scale Community-Based Mangrove rehabilitation (IBRD: US$247 million)	• This sub-component will finance participatory mangrove rehabilitation planning, highlighting the impacts of climate change and supporting adaptation of villages to climate risk and promoting climate resilience. • Preparation and implementation of mangrove rehabilitation field schools will build capacity on mangrove rehabilitation and contribute to coastal resilience.	• This subcomponent will finance mangrove rehabilitation activities, which will reduce/remove emissions from the deforestation or degradation of mangroves by 38,249,642 tCO_2e over 30 years, a 243 percent reduction compared to the baseline of 15,750,000 tCO_2e. Average annual emission reductions/removals are 1,274,988 tCO_2e/year (See Table A3.2 for details.).
Of which PBC-linked		
PBC1: Mangrove area with appraised and approved rehabilitation plans (hectares) (US$18 million)	• PBC1 ensures that the key steps of assessment, design, and planning for rehabilitation and monitoring are carried out. It will strengthen the effectiveness of mangrove rehabilitation efforts, thereby strengthening the coastal resilience provided by rehabilitation.	• More robust and effective mangrove rehabilitation efforts will promote emission reductions.
PBC2: Mangrove area under rehabilitation and management (hectares) (US$30 million)	• PBC2 ensures that rehabilitation is implemented in the identified area according to agreed technical guidelines, with adequate time for monitoring of results. It will strengthen the effectiveness of mangrove rehabilitation efforts, thereby strengthening the coastal resilience provided by rehabilitation.	• More robust and effective mangrove rehabilitation efforts will promote emission reductions.
PBC3: Mangrove area rehabilitated and managed (hectares) (US$45 million)	• PBC3 ensures that areas that have been rehabilitated experience a minimum survival and growth rate, measured by stem density on the ground after 18 months of implementation. It will incentivize the maximum effectiveness of mangrove rehabilitation efforts, thereby strengthening the	• More robust and effective mangrove rehabilitation efforts will promote emission reductions.

	coastal resilience provided by rehabilitation.	
Subcomponent 2.2. Sustainable Mangrove Management (IBRD: US$53 million) This sub-component supports the sustainable management and protection of mangroves.	• This sub-component will finance the designation of Mangrove Stewardship Villages, subnational and participatory village-level management planning, the integration of mangrove management plans into village economic development and other plans, and mangrove-related conflict resolution, highlighting the impacts of climate change and supporting adaptation of villages to climate risk and promoting climate resilience. • Activities for sustainable management and protection of mangroves will strengthen coastal resilience by reducing flood risk and erosion by attenuating storm surge and dissipating wave energy, thereby avoiding damage to coastal communities and assets, conserving biodiversity, and promoting sustainability of mangrove-dependent livelihoods, thus reducing the vulnerability of communities to climate-induced shocks. • Mangrove management activities will build capacity for mangrove protection and contribute to coastal resilience. • Strengthening coordination through the formation and enhancement of multistakeholder forums and developing and integrating village-based and subnational mangrove management plans will reduce deforestation and degradation and contribute to climate change adaptation.	• Sustainable management and protection of mangroves, including strengthened coordination and mangrove management plans, will avoid ongoing and future mangrove deforestation and degradation, which will reduce emissions. Mangrove management field schools will build capacity on mangrove protection, thus reducing emissions. GHG emission reductions and removals from this sub-component total 29,418,162 tCO_2e over 30 years, which is a 37.5 percent reduction compared to the baseline of 78,448,431 tCO_2e. Average annual emission reductions/removals are 980,605 tCO_2e/year (See Table A3.2 for details.).
Of which PBC-linked		
PBC4: Sub-national mangrove management plans submitted for approval by relevant authorities (number) (US$7 million)	• PBC4 ensures that mangroves within target provinces are managed according to a defined plan that has the buy-in of the relevant authorities. It will strengthen the effectiveness of mangrove conservation efforts, thereby strengthening the coastal resilience provided by conservation.	• More robust and effective mangrove conservation efforts will promote emission reductions.
Component 3. Improving Livelihood Opportunities for Mangrove Communities (IBRD: US$80 million)		
Component 3 approach	• Through Component 3, coastal communities, which are vulnerable to the impacts of climate change, will be able to better cope financially with the impacts of climate change.	• Indonesia's mangrove deforestation and degradation rate is 13,000 ha/year, driven by conversion to high-value commodities, in particular aquaculture ponds for seafood which accounts for almost half of the loss, followed more recently by the development of oil palm plantations which account for 16 percent of the loss. Component 3 activities will reduce this loss, as below.

Sub-component 3.1. Community-Based Livelihoods (IBRD: US$18 million) This subcomponent will support rapid assessments of local markets and coastal field schools.	• Local market assessments will be climate-informed, assess climate risks, and/or identify possible disruptions due to climate change. • Coastal field schools will train producers on low-impact, adaptive production practices; enterprise skills training will promote the sustainability of these practices.	• Coastal field school curricula will include topics that strengthen value chains and reduce pressures on mangroves, and enterprise skills training will promote the sustainability of these practices, thus reducing emissions. • Local market assessments and coastal field schools will introduce and strengthen sustainable production practices in key coastal livelihood activities to reduce mangrove loss. This is crucial for achieving Indonesia's NDC mitigation commitment, which is to be achieved in part through sustainable forest management and improved agriculture productivity which will maintain carbon sinks. Subcomponent activities will lead to a paradigm shift to new market segments, as activities will introduce knowledge and skills on sustainable livelihood activities, and productive activities will be selected based on village plans developed under the project. This shift will sustain and increase emission reductions by scaling up activities and will be measured by the PDO indicator "People using sustainable livelihood activities supported by the project" and the IR indicator "People with increased knowledge and skills on sustainable livelihoods activities."
Sub-component 3.2. Coastal Enterprise Development (IBRD: US$62 million) This sub-component will support business grants and technical assistance.	• This sub-component aims to identify and support climate adaptation within value chains and through business grants. Value chain assessments will incorporate analyses of the vulnerability of coastal livelihoods and value chains such as agriculture, ecotourism, and aquaculture to climate risks, expected climate change impacts in target areas, and appropriate adaptations. Climate change analysis will inform the eligibility and viability criteria for business grants. • Technical assistance to prepare and implement business plans will focus on ensuring that the funded business activities meet ecological viability criteria, to avoid increasing pressure on fragile ecosystems, thereby supporting coastal resilience.	• Technical assistance to prepare and implement business plans will focus on ensuring that funded business activities meet ecological viability criteria to reduce pressure on fragile ecosystems, thereby maintaining carbon sinks and mitigating greenhouse gas emissions. Development of sustainable enterprises in coastal commodity value chains is crucial for achieving Indonesia's NDC mitigation commitment, which is to be achieved in part through sustainable forest management and improved agriculture productivity. In addition, Indonesia's NDC commits to reducing emissions from deforestation and forest degradation through creating an enabling environment for environmentally friendly (including low carbon) technologies, which will be achieved by providing sustainable coastal businesses with training, assets and access to finance and business development to sustain and scale up their activities. Subcomponent activities will lead to a paradigm shift to new market segments by facilitating the emergence of sustainable coastal micro and small businesses in/near mangrove forests and improving engagement with enterprise

		development programs and the private sector. This shift will sustain and increase emission reductions by scaling up activities, and will be measured by the IR indicator, "Percentage of approved business plans which are completed."
Component 4. Operation Management (IBRD: US$20 million)		
	• Component 4 supports management of the above activities.	• Component 4 supports management of the above activities.

Table A3.2. Project emission reductions from mangrove rehabilitation and sustainable mangrove landscape management activities compared to the baseline

Parameter	Sub-component 2.1: Mangrove rehabilitation	Sub-component 2.2: Sustainable mangrove management (avoided deforestation)
Baseline emissions factors, $tCO_2e\ ha^{-1}\ year^{-1}$	7	95
Total project area	75,000 ha	679,110 ha*
Total effective project area of avoided deforestation/ ARR	38,000 ha	10,314 ha
Baseline emissions from project area (tCO_2e)	**15,750,000**	**78,448,431**
Estimated GHG emissions *reductions* against the baseline over 30 years (tCO_2e)	7,671,440	29,418,162
% GHG emission *reductions* against the baseline from effective project implementation	48.7%	37.5%
Estimated GHG *removals* over 30 years as mangrove forests develop	-30,578,202	N/A
Net GHG emissions *reductions* and *removals* over 30 years (tCO_2e)	**-38,249,642**	**29,418,162**
% against the baseline over 30 years	243%	37.5%
Average GHG emissions *reductions* and *removals* per year (tCO_2e)	**1,274,988**	**980,605**
% against the baseline per year	8.1%	1.3%

*This is the total mangrove extent within the provinces where Sub-component 2.2 will be implemented. The estimated rate of loss across all provinces is estimated to be 0.81% per year, which equates to 5,501 ha per year or 27,504 ha in total over 5 years. The project is assumed to be effective at slowing the loss of 0.25% of mangroves in year 1, or 1,375 ha, which increases in 6.25% increments per year as the project is implemented so that by year 5 the project is successful in halting 50% of ongoing deforestation (2,750 ha), or 10,314 ha in total out of 27,504 ha. A 30-year timeframe is considered as it is a typical timeframe for carbon emission reduction programs and it is considered the economic lifetime of the project as per the Economic and Financial Analysis conducted for the project. Baseline emissions (or reductions) are calculated as: GHGbiomass loss + GHGsoil loss - GHGsequestration. Emissions removals are calculated as: (GHGsequestration + GHGsoil) + GHGnon-CO2.

Data sources:
Biomass, soil stocks, mangrove net ecosystem production, aquaculture ponds net ecosystem production: Arifanti, V. B. (2017). Carbon Dynamics Associated with Land Cover Change in Tropical Mangrove Ecosystems of the Mahakam Delta, East Kalimantan, Indonesia. PhD Dissertation, Oregon State University.
CH4 and N2O, allochthonous soil carbon burial: Alongi, D. M. (2014). Carbon cycling and storage in mangrove forests. Annual review of marine science, 6, 195-219.
Deforestation rates data interpreted from: Worthington, T., Bunting, P., Cormier, N., Donnison, A., Fatoyinbo, L., Friess, D., Hengl, T., Hilarides, L., Krauss, K., Lagomasino, D. and Leinenkugel, P., 2019. Mangrove restoration potential: a global map highlighting a critical opportunity.

2. Gender. The project undertook a gender gap analysis in which key gender gaps in mangrove rehabilitation, sustainable landscape management, and coastal livelihoods were identified. Actions to fill these gaps through the project and the potential indicators to measure progress in these areas were correspondingly identified. Based on this analysis, the project will ensure that some identified actions are mainstreamed in the project design. The Results Framework has a dedicated gender indicator: *Share of producers and small business owners technically and financially supported by the project who are female;* other indicators will disaggregate results by gender where possible. The gender gap analysis is shown in Table A4.2.

Table A4.2. Gender Gap Analysis

Gender Gap and Analysis	Actions	Possible Indicators
Wage gaps and limited participation of women in cash-for-work programs for mangrove rehabilitation Women are often underrepresented in community development programs due to traditional gender roles such as domestic work and intrahousehold relationships. UNICEF, UNDP, and UN Women found that in the pilot program of village-based cash-for-work programs in Indonesia, although vulnerable groups were targeted by the program, evidence of active involvement of these groups was still limited at the village level.[a] Further, although women have been involved in the cash-for-work program, there is potential for discrimination in the form of wage gaps and underrepresentation of women both vertically and horizontally. In 2020, the average wage for women in Indonesia was only IDR 2,722,531 (US$189 equivalent) compared to IDR 3,503,051 (US$243 equivalent) for men in both rural and urban areas.[b] If there is no intervention, it is probable that a similar wage disparity will also develop in mangrove management initiatives. Women's low pay is also a result of women dominating technical tasks. For example, research in a mangrove conservation program in Rembang Regency, Central Java, showed that the role of women in mangrove conservation was limited to technical work, namely at plant nurseries (*pembibitan*) and as caretakers of mangrove plants.[c]	Adopt measures to ensure the inclusion of women and their equitable treatment in mangrove rehabilitation initiatives and strengthen women's bargaining power and involvement in mangrove management. Some of these interventions include setting a quota for the number of female participants in for cash-for-work programs and v) establishing core labor standards, such as the adoption of antidiscrimination, including prohibition of wage discrimination. **Component 2:** Rehabilitating and promoting sustainable mangrove management.	• *IR Indicator:* People participating in cash-for-work activities supported by the project (percentage of which are women, target 50 percent).
Lack of representation and meaningful inclusion of women in local mangrove management institutions Women play an important role in the cycle of mangrove rehabilitation, especially the nursery stage. For example, in West Kalimantan, women are key participants in the	• Leadership training targeted to women to increase their confidence in and knowledge of mangrove	• *Project M&E system:* # of Mangrove Management and Mangrove Rehabilitation Field School participants, share of

plant nurseries of mangroves, which shows that women can play a part in the rehabilitation of mangroves.[d] However, their roles are limited to only technical works (nursery) and women have not been involved in the planning and decision-making process. This is due to the lack of information dissemination regarding mangrove conservation to certain groups, in which community meetings are only attended by men. Furthermore, additional burdens such as domestic responsibilities (housework and childcare) and lack of proper knowledge on mangrove conservation are also hindering women from taking part in community meetings and in the decision-making process. A study in Rembang, Central Java, showed that women have the basic knowledge on the utilization of mangroves. Not only do women know that mangroves are used to prevent abrasion and strengthen pond embankments, but they also realize that mangroves have aesthetic benefits. These responses are different from men, who tend to utilize the mangroves for their livestock to look for food, while women prefer to avoid mangroves, as they will eat the existing seedlings and leaves in the mangrove.[f] This shows that women have the knowledge to maintain and utilize the conservation of mangroves, which makes them well equipped to be a part of the planning and decision-making processes. Therefore, strengthening women's bargaining power and involvement in the management group is required to enable equality in access and control between men and women in mangrove conservation.	conservation management. • Integration of gender considerations in the Field Schools curriculum, such as gender assessment, sensitization, and gender action planning activities. • Increasing women's involvement in village-level mangrove management and development planning processes. • Increasing women's participation in Mangrove Stewardship Villages and Mangrove Management Field Schools. **Component 2:** Rehabilitating and promoting sustainable mangrove management.	which are women (target 50 percent women). • *Project M&E system:* Village Mangrove Management plans prepared, with planning meetings attended by 50 percent women (target). • *IR indicator:* Share of beneficiaries satisfied with the project's engagement and planning processes (percentage of which are women, target 30 percent).
Lack of access for women to improved or alternative livelihoods activities Gendered social norms and relations impact the capacity of men and women to adopt and innovate in alternative or enhanced livelihood strategies.[h] A mangrove-based livelihood usually involves fisheries, particularly oysters, clams, and fish. However, this livelihood option is mostly for the male members of the family, while women are more involved in traditional caring and household roles, which limits their opportunity to improve their income-generating activities.[j] In Rembang, only 28 percent of women have a productive mangrove-based livelihood by collecting clams and peeling crabs and generating household income.[k] Other barriers would include women's lack of educational background and skills, which may affect their confidence, as well as access in improving their livelihoods. According to the National Strategy of Inclusive Financing for National Women, women-owned enterprises are defined as businesses that have women responsible	• Identifying knowledge and skill gaps that prevent women from entering new industries and designing training to address them. • Provision of financial access for women to start or enhance their businesses, including the acquisition of appropriate equipment and infrastructure. • Ensuring that field schools will have women trainers,	• *PDO Indicator:* People using sustainable livelihood activities supported by the project (percentage of which are women, target 30 percent). • *IR Indicator:* People with increased knowledge and skills on sustainable livelihoods activities (percentage of which are women, target 30 percent). • *IR Indicator:* Share of producers and small business owners technically and financially supported by the project who

in overall operations, or in the daily operations; have 51 percent or more of the capital owned by women, whether personally or through credit; mention women as the person responsible in business legal documents; and have women who own at least 20 percent of shares, holds more than one CEO/COO position for women, and at least 30 percent women in its Board of Directors (if applicable).[l] In this case, women entrepreneurs in MSMEs have limited access to financing to start or expand their livelihood activities.[m] Even though the government has established KUR BRI (*Kredit Usaha Mikro Rakyat Indonesia* or Micro Business Credit) in several regions, including Kalimantan, few women apply for loans, despite its claim to be relatively easy to obtain approval. Nationally, based on a UN ESCAP survey, 41 percent of the surveyed women entrepreneurs indicated that they received no external financial support; and their businesses were entirely self-funded.[n] Sufficient capital is a necessary precondition for small and medium-sized enterprise creation, development, and expansion; however, collateral requirements remain the key obstacles for women entrepreneurs. Formal restrictions on independent asset ownership, credit access, and assumption or disposal of property have already been abolished in Indonesia.[o] However, national legislative reforms have yet to be uniformly implemented in all provinces and districts of Indonesia, with some women still required to provide the co-signature of a male family member as part of the credit application process, and women rarely hold assets independently.[p] Therefore, a gender-sensitive community-based village livelihood plan must also improve the existing conditions for women, including women-owned MSMEs, that are linked with a variety of financing and entrepreneurial opportunities.	facilitators and tailored content / methods to support the needs of women. • Have gender-sensitive business development instruments, such as tailored training modules and specific grant windows for women-owned businesses. **Component 3:** Improving Livelihood Opportunities.	are female (target, 30 percent).

a. United Nations 2021. b. Statistics Indonesia 2020. c. Prastiti, Saksono, and Suadi 2012. d. West Kalimantan Provincial Government 2019. e. Prastiti, Saksono, and Suadi 2012. f. M4CR PCN, Component 2, paragraph 58, page 16. g. Hatfield, Forthcoming. h. Natasha et al. 2019. i. M4CR PCN, Component 2, paragraph 31, page 10. j. Gibon and Stacey 2019. k. Prastiti, Saksono, and Suadi 2012. l. National Strategy of Inclusive Financing for National Women 2020. m. World Bank 2016. n. ESCAP United Nations n.d. o. ESCAP United Nations n.d. p. ESCAP United Nations n.d. MSME = Micro, Small and Medium Enterprises.

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