

Evaluating & Realizing the Value of Indonesia's Forests & Ecosystems



OVERVIEW REPORT



The Value of Nature

Public Disclosure Authorized

Public Disclosure Authorized

Public Disclosure Authorized

Public Disclosure Authorized

A Collaborative Partnership



KEMENTERIAN KEUANGAN

Supported by:



© 2026 The World Bank Group

1818 H Street NW, Washington, DC 20433

Telephone: 202-473-1000; Internet: www.worldbank.org

This work is a product of the staff of The World Bank Group with external contributions. “The World Bank Group” refers to the legally separate organizations of the International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA), the International Finance Corporation (IFC), and the Multilateral Investment Guarantee Agency (MIGA).

The World Bank Group does not guarantee the accuracy, reliability, or completeness of the content included in this work, or the conclusions or judgments described herein, and accepts no responsibility or liability for any omissions or errors (including, without limitation, typographical errors and technical errors) in the content whatsoever or for reliance thereon. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of the World Bank Group concerning the legal status of any territory or the endorsement or acceptance of such boundaries. The findings, interpretations, and conclusions expressed in this volume do not necessarily reflect the views of the organizations of the World Bank Group, their respective Boards of Executive Directors, and the governments they represent.

The contents of this work are intended for general informational purposes only and are not intended to constitute legal, securities, or investment advice, an opinion regarding the appropriateness of any investment, or a solicitation of any type. Some of the organizations of the World Bank Group or their affiliates may have an investment in, provide other advice or services to, or otherwise have a financial interest in, certain of the companies and parties named herein.

Nothing herein shall constitute or be construed or considered to be a limitation upon or waiver of the privileges and immunities of any of the organizations of The World Bank Group, all of which are specifically reserved.

Rights and Permissions:

The material in this work is subject to copyright. Because The World Bank Group encourages dissemination of its knowledge, this work may be reproduced, in whole or in part, for noncommercial purposes as long as full attribution to this work is given and all further permissions that may be required for such use (as noted herein) are acquired. The World Bank Group does not warrant that the content contained in this work will not infringe on the rights of third parties and accepts no responsibility or liability in this regard. All queries on rights and licenses should be addressed to World Bank Publications, The World Bank Group, 1818 H Street NW, Washington, DC 20433, USA; E-MAIL: pubrights@worldbank.org.

Suggested Citation:

World Bank, Ministry of Forestry, and Ministry of Finance (2026). The Value of Nature: Evaluating and Re-realizing the Value of Forest Ecosystems in Indonesia: Overview Report. The World Bank, Washington, D.C.

The
Value
of Nature

Evaluating & Realizing
the Value of *Indonesia's*
Forests & Ecosystems

Overview Report

Introduction:
The Importance of Valuing
Forest Ecosystems
03

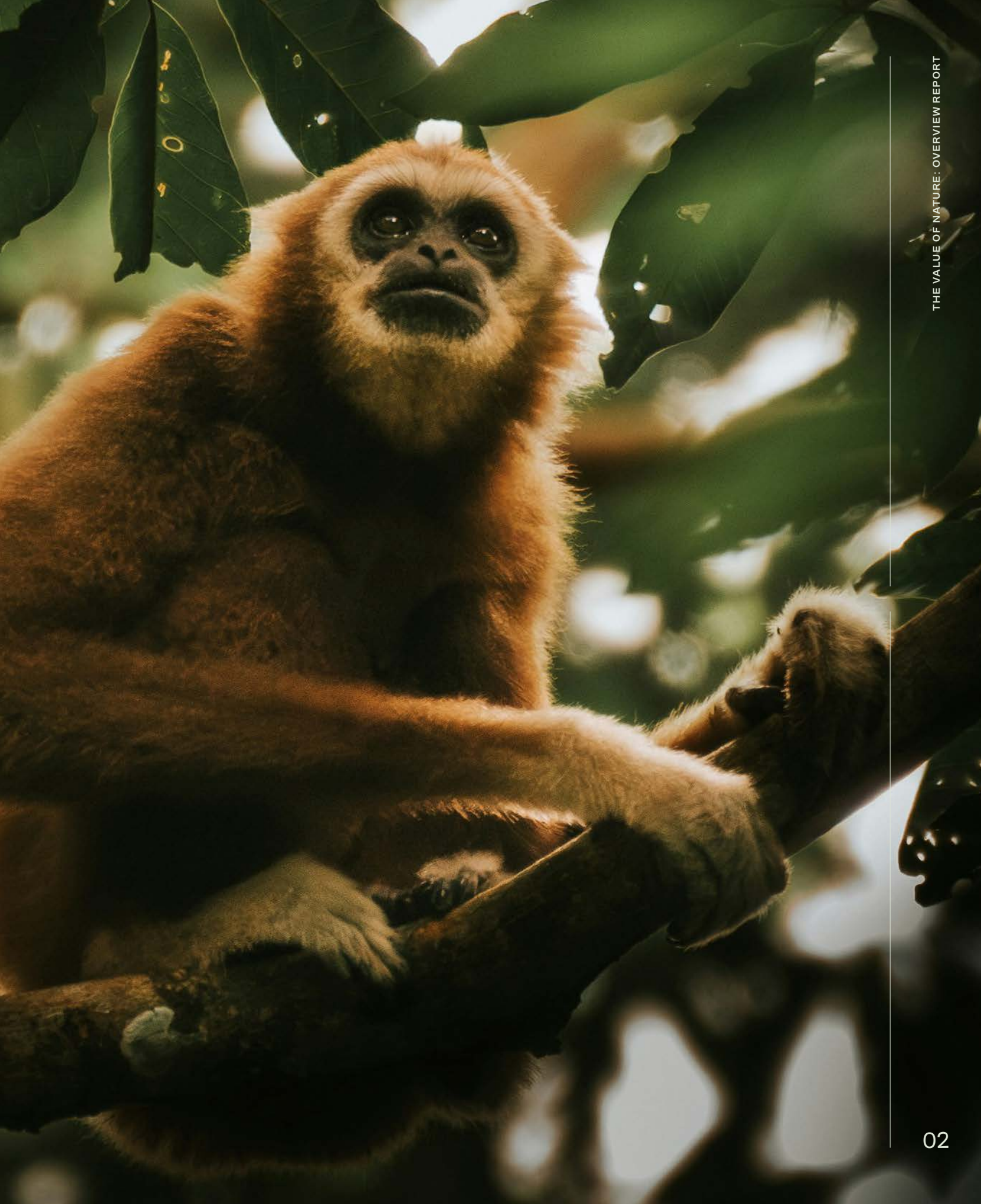
Approach:
Identifying the Value
of Forest Ecosystems
04

Key Findings:
Quantifying the Value
of Forest Ecosystems
06

What's Next?:
Realizing the Value of Indo-
nesia's Forest Ecosystems
12

Overview





Introduction

THE IMPORTANCE OF VALUING FOREST ECOSYSTEMS

Forests are an integral part of Indonesia's identity, culture, and economy. With over 120 million hectares of official forest area, Indonesia represents the third-largest tropical rainforest in the world. These forests are home to exceptionally high levels of biodiversity, potentially ten percent of all known species within just one percent of Earth's land area. They provide a wide range of ecosystem services that support the lives of Indonesia's 280 million people, from timber, food, and medicine production to flood protection water purification, cultural heritage, and recreation. Economically, forests contribute directly to gross domestic product (GDP) and offer numerous non-market values that, while often excluded from traditional economic statistics, are significant for long-term sustainable economic growth.

This report aims to assess the economic value of forest ecosystems and explore how sustainable forest management and restoration can support Indonesia's national development goals. Much of the value provided by forests is indirect and therefore remains 'hidden' from conventional statistical measures.¹ Yet, for the more than 60 million Indonesians who live in and around forest areas, the value of ecosystem services—such as water provision, flood prevention, timber and food production, and fire suppression, among many others—is tangible in shaping livelihoods, incomes, and wellbeing. By applying modelling techniques that integrate ecological functions with economic systems, this report helps to reveal these values in monetary terms. Drawing on these results, it proposes ways that Indonesia can further enhance forest values to achieve national development goals, in alignment with the priorities of the Prabowo Subianto administration.

Recognizing the vital benefits, Indonesia has set ambitious goals for forest management

and restoration. President Prabowo Subianto's administration, inaugurated in October of 2024, has placed environmental harmony—balancing nature, culture, and economic development—as one of its eight core aspirations (*Asta Cita*). This aspiration underpins key Presidential Priorities, including food, water and energy security (Presidential Priority Program No. 1), environmental preservation (No. 11), and sustainable use of natural resources to create jobs and promote economic equity (No. 15). Forests are central to achieving these objectives, through agroforestry, biofuel production, high-value commodities like spices and timber; carbon sequestration; and protection of water catchments. The Ministry of Forestry has outlined five key actions for sustainable forest management aligned with these national priorities, including strengthening agroforestry and social forestry.² At COP 29 in Azerbaijan, the Government further committed to restoring 12.7 million hectares of degraded forest land, one of the largest restoration ambitions globally.³

These ambitions build on a decade of steady progress. Deforestation nationwide decreased by over 80 percent since 2014 (FIGURE 1), a contrast to the increasing trends seen in many other major tropical forest countries. The State of Indonesia Forests (SOIFO) 2024 report highlights key efforts undertaken during this period, including large-scale forest and land restoration, expanded community engagement and land tenure reform, regulatory action to curb deforestation, and enhanced wildfire control. These actions contributed to the low deforestation rates targeted in the new Medium-Term National Development Plan (2025-29). They also support Indonesia's climate commitments (FIGURE 2), and align with the 2025-2045 Indonesia Biodiversity Strategy and Action Plan (IBSAP).⁴ They can further contribute to a more inclusive and productive forest economy, one that helps lift rural communities out of poverty while sustaining vital forest ecosystems.

¹ The non-marketed ecosystem services are often not priced or underpriced and thus not fully captured in standard national accounts, including GDP. This report aims to address this gap.

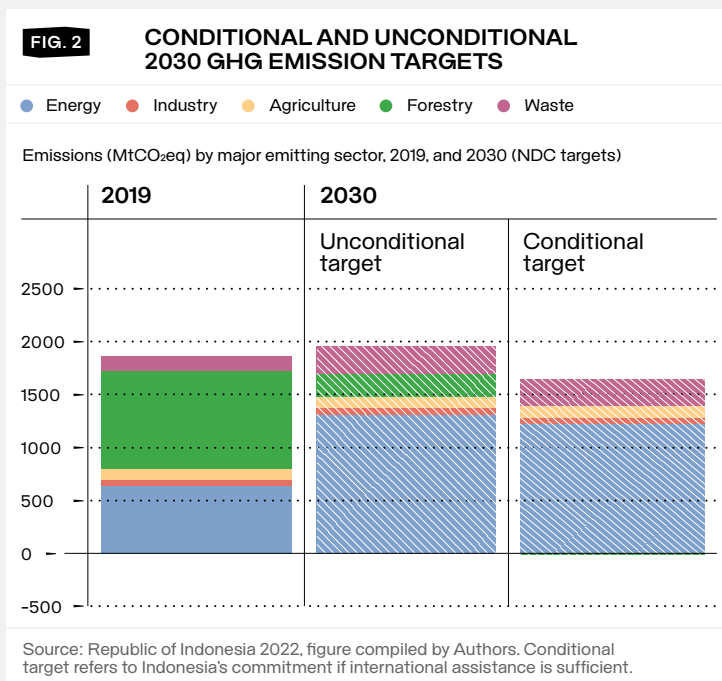
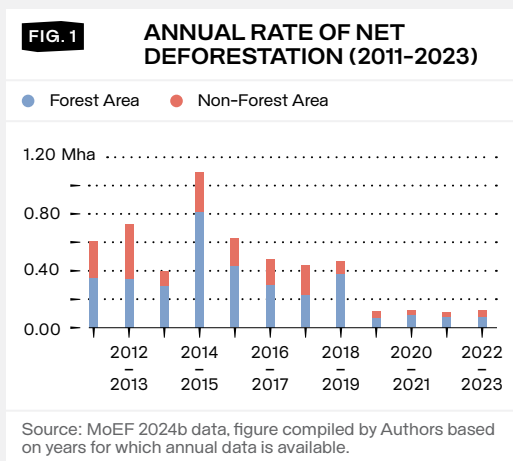
² Ministry of Forestry (2024). Priority Programs for the Ministry of Forestry: Red and White Cabinet, 2025. Jakarta.

³ According to the Ministry of Forestry's 2024 strategic priority, the restoration will include 7.4 million hectares in forest area and 5.3 million hectares in non-forest area ([link](#)).

⁴ IBSAP provides a framework and targets for biodiversity management between 2025-45. Updates are planned for every five years ([link](#)).

80%

“
Deforestation nationwide decreased by over 80 percent since 2014



Approach

IDENTIFYING THE VALUE OF FOREST ECOSYSTEMS

i

Incorporating ecosystem services into an economic framework is challenging, primarily because many of their benefits are indirect and not easily captured by conventional metrics.

For example, forests help to prevent the cost of flooding by moderating water runoff. They also help prevent costly landslides by securing steep slopes. They reduce the cost of water treatment by helping to filter water before it reaches rivers and reservoirs. Good forest management suppresses fires, which otherwise damage infrastructure and generate air pollution that harms human health and reduces labor productivity. These values are not traditional economic values (which can be accounted for, priced, taxed, and reported) for three reasons. First, because they are public goods, meaning they benefit many people without exclusion (this makes it difficult to charge people for these benefits, and thus they are not fully priced by markets). Second, some of their value is felt most acutely in their absence (forest loss leads to costs on the economy, which is not always appreciated until or after it occurs). Third, the links between ecological processes and economic outcomes (e.g., the impact of pollinators

↓ Crab-eating macaque *Macaca fascicularis*



on agricultural productivity) are complex and location-specific, making quantification difficult.

This report uses an innovative ‘bioeconomy’ model—an expanded computable general equilibrium (CGE) model—to overcome some of these challenges. The model combines economic statistics from Indonesia’s Statistics Agency (*Badan Pusat Statistics*, BPS) with ecological statistics from Indonesia’s State of the Forests (2024) report, and other literature. The model reveals ‘shadow prices’ for ecosystems by linking the physical quantifiers of ecosystem services to the value generated by the parts of the economy dependent on those services. Like all models, this model can only provide an *approximation* of value (an important caveat). Yet, it represents one of

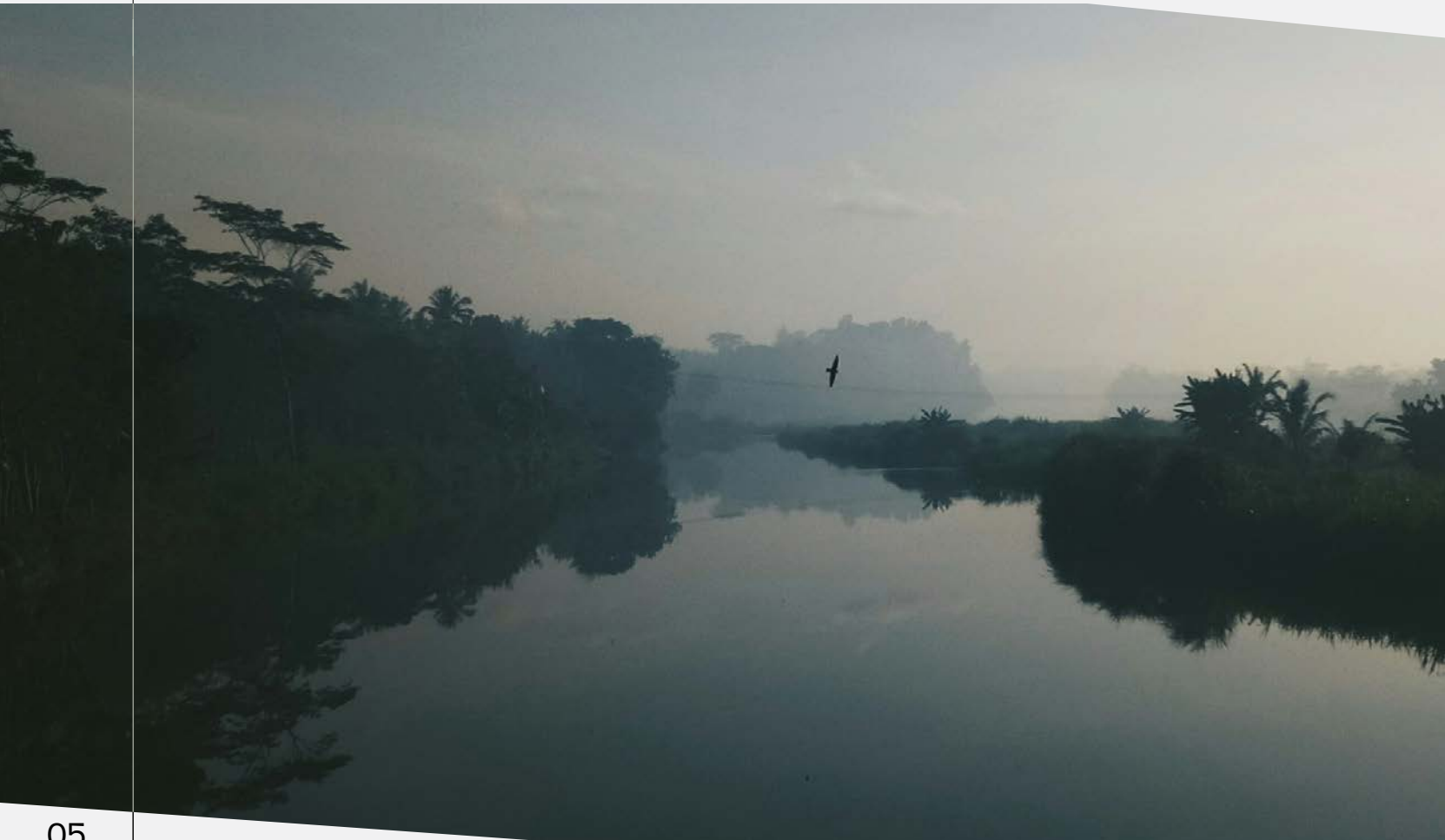
the more comprehensive efforts to value of forest ecosystems at scale to date. Importantly, the values are in terms of the ‘whole economy’ (i.e., they include flow-on effects⁵).


The report complements results from the bioeconomy model with a mapping of ecosystem services – to determine where hotspots of value are found—along with recommendations for how values can be enhanced and realized. Policy options for protecting and harnessing these economic values were developed through consultation with government and non-government stakeholders. In doing so, the report aims to help inform policymakers and other stakeholders on how to achieve Indonesia’s ambitious goals for forest management and restoration.

⁵ When economic activity is supported in one part of the economy, it creates secondary economic activity in other sectors via increased demand for goods and services. This is revealed by general equilibrium analysis.



Incorporating ecosystem services into an economic framework is challenging because many benefits are indirect”





◀ Silvery gibbon
Hylobates moloch

Key Findings

QUANTIFYING THE VALUE OF FOREST ECOSYSTEMS

1

Nationwide, the ecosystem services provided by forests are estimated to be worth approximately US\$2,100 – US\$5,200 per hectare per year (FIGURE 3).

The most significant contributors to this value are regulating services (such as water filtration), carbon sequestration, cultural services (including tourism), and marketable goods such as timber and food. These values generate both direct economic benefits and secondary effects, as forest-associated sectors pass on benefits to other parts of the economy, for example, by increasing demand for labor, goods, and services, and contributing to government revenues.

2

Marketed timber products contribute more than US\$10 billion to the economy, a significant amount, yet only a small part of the total economic value of forests.

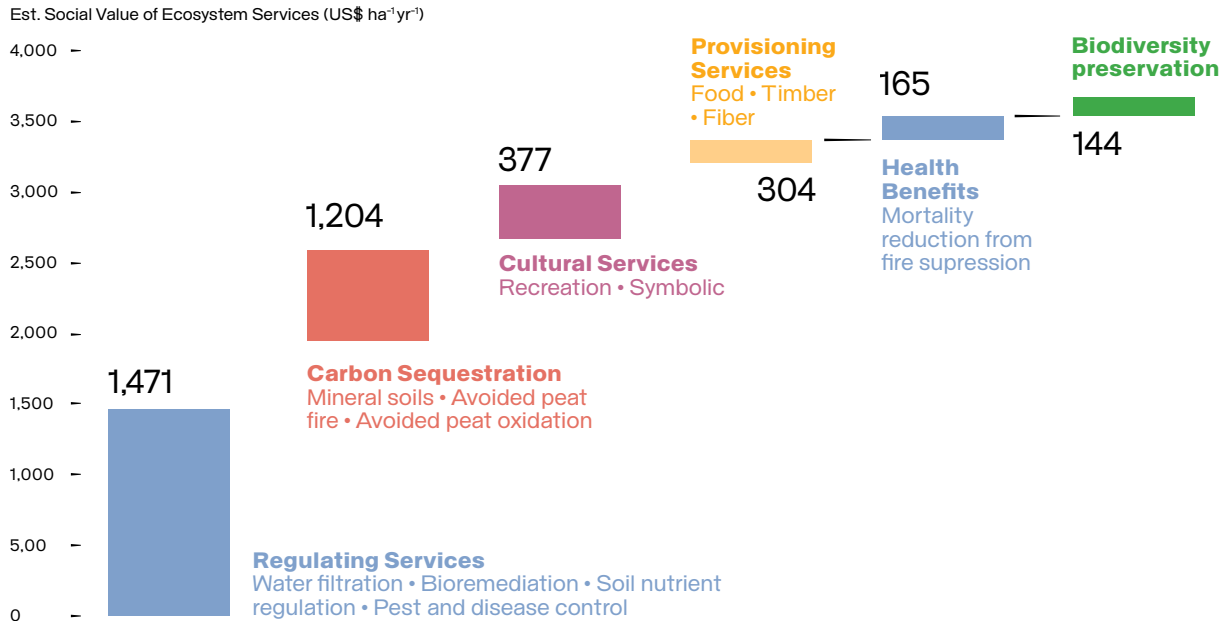
Over the past decades, Indonesia's timber industry has made important contributions to economic growth and has, at times, been the world's largest timber exporter. Today, forest products and their downstream industries—such as wood processing—account for around 1.2 percent of Indonesia's GDP.⁶ However, as explored in this report, forests should be valued not only for their contribution to the market economy but also for the broader range of ecosystem services they provide. There is also potential to increase sustainable market production, as discussed further in the report.

⁶ Statistics from BPS (2024) ([link](#)), including timber harvesting and the manufacture of wood products. As is common in many countries' development trajectory, the proportion of the economy represented by primary sectors (forestry, fishery, agriculture) declines over time as manufacturing and services sectors grow by comparison.

FIG. 3

ESTIMATED PER HECTARE VALUE OF ECOSYSTEM SERVICES PRODUCED BY FORESTS

Annual value of ecosystem services provided by one hectare of forest (Indonesia average)



Source and Notes: Results from Indonesia Bioeconomy 202 CGE, calibrated with available data on forest production and ecosystems from different types of forests and regions. See Full Report for model details. Figures compiled by authors.

3

Indonesia's restoration and conservation efforts, as outlined in its Enhanced Nationally Determined Contribution and FOLU Net Sink 2030 Plan, could generate economic and ecosystem benefits valued at US\$65-121 billion over eight years.

This includes US\$22-23 billion in productivity and health gains through reduced forest fire pollution, US\$14-15 billion in enhanced ecosystem services, and US\$9-53 billion through the economic stimulus associated with restoration activities and enhanced agricultural productivity (FIGURE 4).⁷ It is important to realize that while some of these are monetary benefits, others are non-monetary (although still important for the economy).

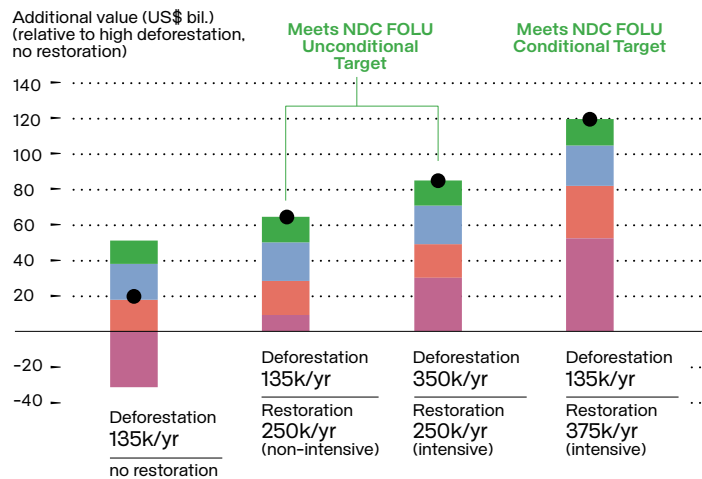
⁷ The range in these estimates is a function of the size and investment intensity of restoration plans (ranging from 2 million hectares, with an investment of US\$2,000 per hectare, versus 3 million hectares, with an investment of US\$6,500 per hectare). For cost comparison purposes, the median implementation cost of active forest restoration globally is US\$3,729 per hectare (with an interdecile range of US\$1,530-11,675 per hectare). Estimates were developed using a database of establishment and maintenance costs in World Bank-supported forestry projects (see Busch et al. 2024).

FIG. 4

ESTIMATED VALUE (ECOSYSTEM SERVICES AND GDP) OF DIFFERENT POLICY SCENARIOS

Cumulative additional value (over 8 years) generated relative to a high deforestation BAU scenario (US\$ billion).

- Avoided ecosystem services losses
- Avoided human capital losses
- Avoided GHG emissions (\$5 per tonne)
- Nominal GDP
- Adjusted GDP (Net Social Benefits)



Source and Notes: Results from Indonesia Bioeconomy 202 CGE. The reference scenario (RHS) is the high deforestation BAU from Indonesia's ENDC (approx. 800k ha/yr deforestation and no restoration). CM1 and CM2 are Indonesia's unconditional and conditional emissions targets respectively. See Box 3 and Annex 1 for model details. Figures compiled by authors.



US\$ 65–121 billion



Indonesia's restoration and conservation efforts, as outlined in its Enhanced Nationally Determined Contribution and FOLU Net Sink 2030 Plan, could generate economic and ecosystem benefits valued at US\$65-121 billion over eight years



4

Each dollar invested in restoration has an estimated social payoff of US\$6.9-11.0, depending on the type of restoration and the types of benefits considered



Each dollar invested in restoration has an estimated social payoff of

6.9-11.0

US\$

depending on the type of restoration and the types of benefits considered

However, restoration requires significant upfront investment. Land restoration activities such as planting, land preparation, and tending cost between US\$2,000 and US\$6,500 per hectare. For the scenarios simulated (2-3 million hectares of restoration), US\$4-13 billion (IDR 65-211 trillion) in total investment would be required.⁸ In an era of constrained public finances, it is not realistic to expect the government to cover more than a small portion. Private sector contributions will be required. With the right enabling conditions, the private sector may be willing to invest in profitable agroforestry restoration and carbon credit-generating activities, among others. Significant regulatory work would be needed to support carbon credit development. Meanwhile, productive land restoration for sustainable forest commodity production has been estimated at US\$3.3-5 billion per annum from a 2-3 million-hectare restoration area.⁹



Clouded leopard
Neofelis nebulosa

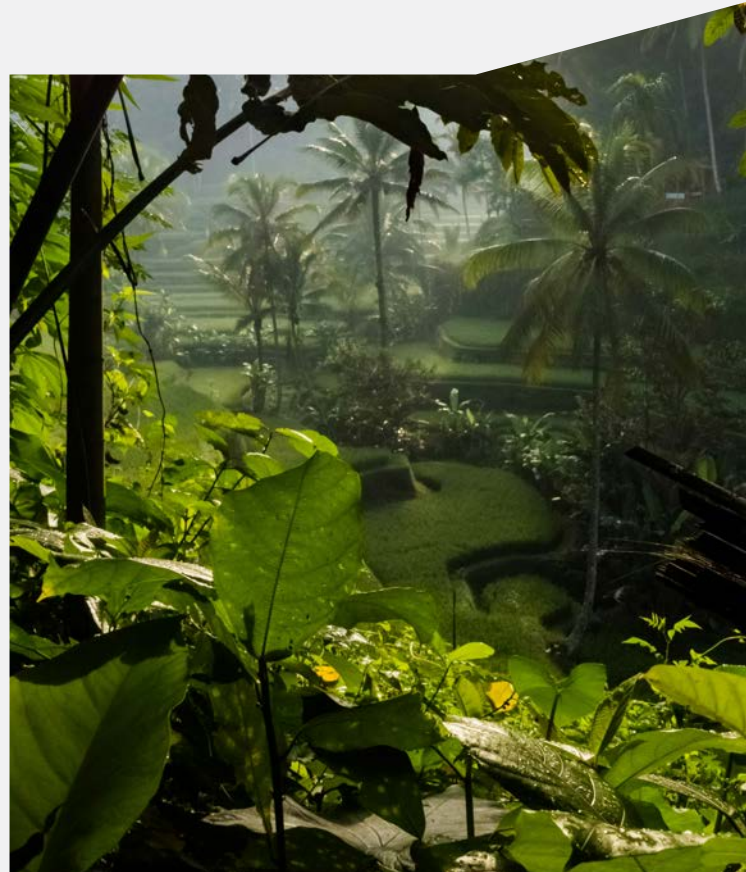
⁸ US\$4 billion represents a low cost (US\$2,000 per hectare) restoration extending over 2 million hectares. US\$13 billion represents a high cost (US\$6,500 per hectare) restoration extending over 3 million hectares. See footnote 7 for cost explanation. In reality, a mix of restoration types will be most suitable.

⁹ Non-carbon revenues are based on analysis by Systemiq MFP, MoEF, and UK Aid (2021), assuming revenues of US\$2,000 per hectare annually (based on potential returns for agroforestry,

5

Low rates of deforestation are a net social benefit for Indonesia

Indonesia has already achieved a significant slowdown in deforestation, to about 130,000 hectares per year in 2023. Reverting to the deforestation rate of a decade ago—of around 850,000 hectares per year could, in principle, increase agricultural production (by an estimated US\$31 billion over an eight year period to 2030). However, these gains would be outweighed by an estimated US\$20.4 billion in health costs and productivity losses due to fire and associated air pollution, and US\$13 billion in losses of other ecosystem services (such as water security and flood prevention), even without considering a carbon value. Thus, Indonesia has benefited on net from actions to slow deforestation over the past decade.



6

Forest restoration offers opportunities to boost rural incomes and reduce poverty

The Ministry of Forestry has identified approximately 12.74 million hectares of ‘critical’ (degraded) lands. Restoring a fraction of this land at a rate of 250,00-375,000 hectares per year could generate net social benefits as discussed above, and in turn reduce the national poverty rate by 0.2 to 0.79 percent, all else being equal (FIGURE 6). Most of this poverty reduction is driven by direct economic stimulus: public and private investment in planting activities boosts local incomes and, thus, poverty reduction. It also includes the longer-term economic output from restored land, including agroforestry and non-timber forest products.

7

While both forest restoration and reduced deforestation offer important benefits, reducing deforestation delivers greater ecosystem services value

On a per-hectare basis, the model shows a significant gap between the ecosystem services value of plantation forests (around US\$2,400 hectares per year) and primary forests (around US\$3,700 hectares per year) (FIGURE 5). This has an important implication: plantations—and thus restoration activities—do not substitute fully for the protection of existing (primary) forests due to primary forests’ biological and structural diversity (which gives them higher ecosystem function). That said, there are areas of degraded forest where restoration could both enhance ecosystem services delivery and production of marketable forest and agroforest (food) products. The RPJMN (2025-29) targets a reduction in the deforestation rate from 0.120 million hectares per year in 2024 to 0.094 million hectares per year in 2029.



FIG. 5 ESTIMATED VALUE OF FOREST ECOSYSTEMS SERVICES BY FOREST TYPE

Avg. estimates (nationally) by type of forest (US\$ ha⁻¹yr⁻¹)

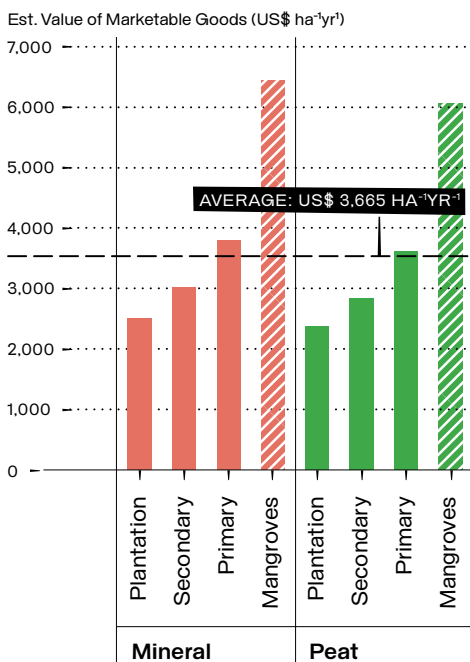
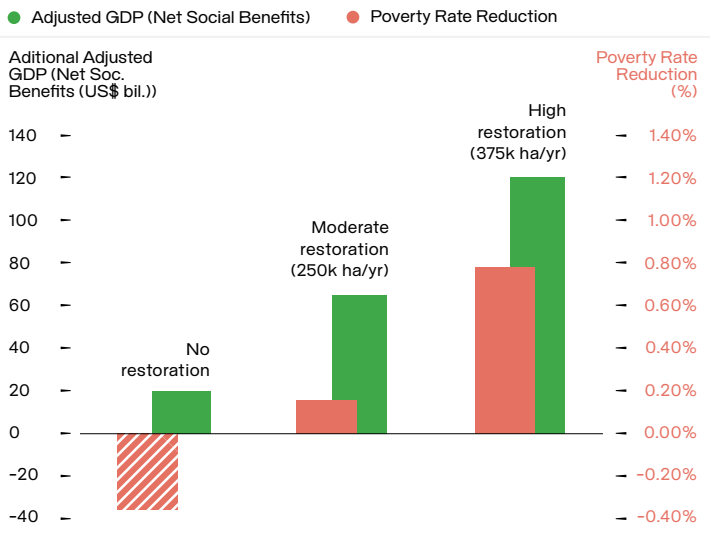


FIG. 6 NET SOCIAL BENEFITS AND POVERTY REDUCTION UNDER RESTORATION SCENARIOS



Source and Notes: Results from Indonesia Bioeconomy 202 CGE. See main report for model details. Figures compiled by authors.

8

The report’s mapping shows that Indonesia’s biodiversity richness and carbon storage vary by forest type and location, reflecting the country’s geographical and ecological diversity

Primary forests serve as major carbon sinks, particularly primary peatland forests, which are among the largest carbon stores on the planet. Biodiversity hotspots are concentrated in Sumatra, Kalimantan, and Papua, with around 35 percent of Indonesia’s forests classed as “biodiversity hotspots.”¹⁰ While primary forests contain the highest levels of biodiversity, secondary forests also host a substantial share of species diversity. These highlight the importance of maintaining not only primary forests but also well-managed secondary forests as part of a comprehensive conservation strategy.

9

Forests play a crucial role in delivering water security in Indonesia, accounting for 66.5 percent of the country’s clean water supply

Although much of this purification occurs in more remote catchment areas, the impact on water security remains significant. Forests filter sediments and pollutants such as fertilizers and excess nutrients, purifying water that would otherwise be unsuitable for human use without treatment. This function is important given that over 80 percent of Indonesia’s population depends on non-piped water sources for domestic purposes. Maintaining healthy forest ecosystems can therefore help reduce water treatment costs.¹¹ In addition, forests regulate surface water runoff and thus mitigate the risks of floods and landslides. Notably, forest areas near Jakarta provide the highest economic value per ha in terms of flood prevention.

spices, bamboo, and other profitable restoration activities).

¹⁰ Biodiversity hotspots are defined as locations which contain the top 30 percent of Indonesia’s species richness based on the distribution of vertebrate species under the IUCN Red List (Pouzols, et al. 2014).

¹¹ Treatment facilities are usually still required to ensure no contaminants and full potability. However,

66% of freshwater is purified by forests in Indonesia, contributing to water security



➤ Proboscis monkey
Nasalis larvatus



What Next?

REALIZING THE VALUE OF INDONESIA'S FOREST ECOSYSTEMS

To sustain and enhance values, four categories of action could be pursued: (1) understanding and quantifying nature's values, (2) mobilizing new sources of financing, (3) protecting and restoring natural assets, and (4) growing the nature-positive economy. These actions are reflected in various government strategies and plans, underscoring Indonesia's commitment to greener and higher-quality growth. Relevant frameworks include the RPJMN (2025-29), the National Long-term Development Plan (2025-50), the Long-term Strategy for Low-Carbon and Climate Resilience (Republic of Indonesia, 2022), the Indonesia Biodiversity Strategic Action Plan (2025-45), and the FOLU Net Sink 2030 Operational Plan. The four proposed categories of action are mutually reinforcing (FIGURE 7). This is because a better understanding of nature's values can help to raise and direct financial flows (and inform more effective policy). In turn, financing and sound policies are essential for protecting and restoring natural ecosystems. These healthy ecosystems then support key sectors of the economy—such as tourism, forestry, and agriculture—that depend directly on nature.

FIG. ES 7 CATEGORIES OF ACTIONS FOR REALIZING THE VALUE OF NATURE



Source: Authors

A SUMMARY OF OPTIONS & OPPORTUNITIES INCLUDE THE FOLLOWING ↙

1



Understanding and quantifying nature's values

Making the value of nature explicit through accounting frameworks and standardized cost-benefit analyses can help mobilize financing and inform better policymaking. Indonesia's Integrated System of Environmental-Economic Accounts (SISNERLING), developed by the National Statistics Agency (BPS), is a strong framework for tracking the value of natural assets. Currently, SISNERLING covers land, timber, energy, and mineral resources. Expanding it to include ecosystem services—and embedding its data into the medium- and long-term development plans—would be valuable. To support stronger policy and program assessment, standardized valuation approaches could be developed to enhance the consistency and comprehensiveness of cost-benefit analysis, which could be mandated for use on major public projects and policies.

2

Raising and channelling financing from domestic and international sources

→ **Conservation trust funds can effectively mobilize and allocate funding – including contributions from international donors.** Given public budget constraints, new financing sources are essential. The enactment of Law No. 32 of 2024 on the Conservation of Natural Resources and Ecosystems, along with the Indonesia Biodiversity Strategic Plan (IBSAP) 2025-2045, provides a strong foundation to establish a dedicated conservation fund. This fund could attract bilateral and philanthropic resources, in line with the Global Biodiversity Framework, which calls for increased international biodiversity financing. The newly launched Indonesia Biodiversity Fund (I-Bio Fund) could serve as such a vehicle. To be most effective, the fund will need to set clear up-front (time-bound) goals, be managed under independent governance systems, and undertake rigorous impact evaluation. These are the features that give donors confidence and have made similar funds (e.g., Brazil's FUNBIO) successful (Cabrera, et al. 2021). However, the current international fundraising environment is challenging and should be navigated with realistic expectations.



→ **Carbon markets represent another pathway for financing nature.** Continued streamlining of the regulations, requirements,¹² full operationalization of the national carbon registry system, and development of a nesting framework (to allow both project-level and jurisdictional carbon credits to coexist) are critical to scale up carbon markets. International-standard verification schemes can help to increase carbon credit prices. Integrating the forest and land use sector into Indonesia's emissions trading scheme (ETS), as planned by the government, will further help channel significant finance into forest conservation and restoration. A well-calibrated (i.e., sufficiently tight) emissions cap in the ETS will be important to create demand for forest carbon credits.

forests reduce the costs and improve the effectiveness of treatment.

12 MoEF Regulation No. 7 of 2023 and MoEF





3



→ **Ecological Fiscal Transfer (EFT) mechanisms can help align sub-national actions with national environmental goals.** EFTs have proven powerful in countries with decentralized governance. For example, China has directed over US\$235 billion through EFTs since 2001, leading to transformative outcomes in landscape management (World Bank 2022). Indonesia currently has six EFT instruments operating at a smaller scale, demonstrating feasibility. There could be scaled up by formalizing the existing small programs and issuing technical regulations in line with Law No. 1 of 2022 which governs intergovernmental fiscal relations. Key steps include adjusting public revenue allocations, refining effectiveness indicators, clarifying sub-national spending rules, and integrating carbon revenues into EFT frameworks.

→ **Public bond issuances linked to sustainability metrics offer opportunities to reduce borrowing costs.** With limited fiscal space, some countries are exploring ways to tie financing to environmental performance. Indonesia has laid the groundwork through its green financial framework, Financial Services Authority (OJK) regulation No. 51 of 2017, and Law No. 4 of 2023 on Financial Sector Development. A promising tool is to use sustainability-linked bonds, which reduce interest rates when pre-agreed sustainability targets – such as deforestation reduction – are achieved. Unlike green bonds, these instruments are not tied to specific activities, offering greater flexibility in fund utilization.

→ **Private sector investments—supported by multi-use forest business licensing—can play a pivotal role in supporting forest restoration.** While public financing remains essential for ecological restoration and management efforts that serve broader public goods, the private sector can be mobilized for profitable restoration activities, such as agroforestry, bamboo, essential oils, fibers, spices, and carbon-credits projects. The Multi-Business Concession (*Multi Usaha Kehutanan*, MUK) approach presents an opportunity for encouraging private sector restoration. MUK uptake could be accelerated through clearer regulatory guidance, accessible extension services, and faster approval processes. MUK concession holders can also be incentivized to build partnerships with local communities – allowing community members to harvest forest products or engage in agroforestry within concession areas under revenue-sharing agreements.

“ Private sector investments—supported by multi-use forest business licensing—can play a pivotal role in supporting forest restoration”

“ Investing in key agroforestry commodities offers a promising pathway to grow Indonesia’s regenerative economy.”



→ **Strengthening the forest moratorium could help protect high-value ecosystems, complemented by agricultural productivity measures.** Indonesia’s moratorium on the conversion of primary forests and peatlands has contributed to the decline in national deforestation rates. To further enhance protection of high-value ecosystems, the moratorium could be formalized into law and its coverage extended to include currently unprotected ecosystems such as high-value mangroves, priority watersheds, and remaining peatland areas. Efforts should include a review of plantation licenses within the forest estate to optimize cultivated areas. At the same time, increasing agricultural productivity—through measures such as precision fertilization, improved seed varieties, and enhanced access to markets and financ—can help achieve food security goals while reducing pressure on natural forests.

→ **Enhancing fire prevention and response systems can help combat forest fires.** Indonesia has made progress in reducing the incidence of forest fires and their associated economic impact and haze over the past decade. However, 2023—a year marked by El Niño—saw a temporary spike.¹³ In the face of climate change, continued strengthening of fire prevention systems is essential. The government plans to establish an integrated task force focused on early fire detection and preparedness. This task force, comprising the Ministry of Forestry (MoFor), the Ministry of Environment (MoE), the Meteorology, Climatology, and Geophysics Agency (BMKG), the National Armed Forces (TNI), the National Police (POLRI), and the Ministry of Home Affairs, will coordinate detection, readiness, and suppression efforts. Enforcing regulations against illegal land-clearing remains a critical step to prevent many fires from starting.

Decree No. 716 of 2023 set out the procedures for carbon trading in forestry, peatland, and mangrove subsectors.



4 Growing the nature-positive economy

(i.e., promoting growth in sectors that sustainably harness nature)

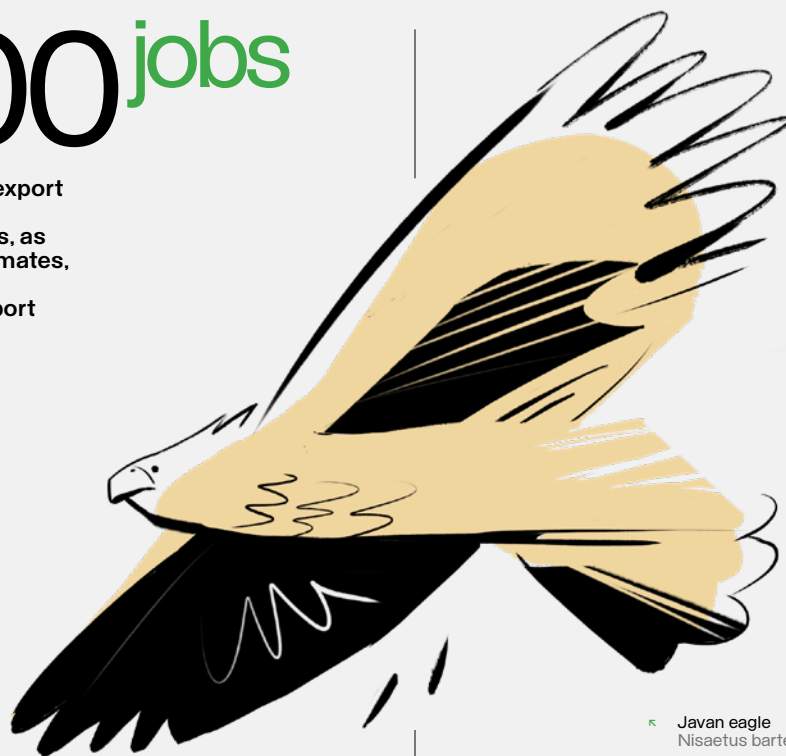
→ **Strengthening social forestry, linking producers to markets, and increasing forest businesses’ access to capital will help build a vibrant “forest economy.”** As of December 2024, Indonesia’s social forestry program had granted legal use rights over 7.9 million hectares to local communities, benefiting more than 1.3 million households. The new administration aims to scale this to 15 million hectares, approximately 30 percent of the nation’s total forest area. To build on this progress, targeted support is needed for community business development, including access to credit and stronger market linkages. One potential mechanism is a *Forest Financing Facility* that channels financing to supply-chain intermediaries (e.g., aggregators) who work directly with communities and smallholders, supporting business growth.

Investing in key agroforestry commodities offers a promising pathway to grow Indonesia’s regenerative economy. Sustainable forest-compatible commodities such as coffee, cocoa, vanilla, and *arenga* present significant opportunities for both export revenue and forest restoration. Globally, the combined export value of coffee and cocoa exceeds US\$52 billion, slightly

800,000 jobs



If Indonesia can increase the export value of its coffee, cocoa, and vanilla sectors by 1.5 to 2 times, as projected by government estimates, it could create 0.8 million jobs and unlock US\$9 billion in export earnings



Javan eagle
Nisaetus bartelsi

surpassing that of palm oil (US\$49 billion).¹⁴ If Indonesia can increase the export value of its coffee, cocoa, and vanilla sectors by 1.5 to 2 times, as projected by government estimates, it could create 0.8 million jobs and unlock US\$9 billion in export earnings – equivalent to approximately 0.6 percent of GDP.¹⁵ In doing so, Indonesia can become a leading supplier of sustainable, high-value forest commodities, contributing to economic diversification and job creation.

→ **Enhancing sustainable production certification, including for smallholders, will improve market access.** Indonesia has introduced key mandatory systems, including the Sustainability and Legality Assurance System (*Sistem Verifikasi Legalitas dan Kelestarian*, SVLK), and the Indonesian Sustainable Palm Oil (ISPO) standard. SVLK has gained international recognition for ensuring the legality and sustainability of timber exports; ISPO has the potential to achieve similar success with expanded support to smallholders to ensure their technical readiness and compliance. Efforts should focus on addressing land tenure issues, expanding farmer outreach, and offering

financial support to cover certification costs. Given their influence on global community markets, major importing countries could be encouraged to contribute to these costs as part of shared sustainability commitments.

→ **Promoting eco-tourism for sustainable local benefits could help increase the economic value of Indonesia's iconic natural areas.** While environmental protection remains the primary objective for protected areas, a national eco-tourism strategy could identify high-potential destinations and recommend investments in supporting infrastructure (e.g., transport, sanitation, and waste management). Such a strategy could also explore pricing models and revenue-sharing mechanisms that can generate funds for park reinvestment and community development, prioritizing 'high-value, low-impact' tourism. Alignment with Law No. 6 of 2023 on Job Creation, which mandates that tourism promote local livelihoods and environmental stewardship, would ensure a sustainable, inclusive approach. In doing so, it is essential to mitigate the risks of over-tourism through careful planning and monitoring.

Together, these four categories of actions—understanding nature's values, raising and channelling financing, protecting natural assets, and growing the nature-based economy—are steps toward a productive and sustainable forest economy. A better understanding of the economic value of nature is an important first step. The modelling conducted in this report can help mobilize new financing—including international contributions—and inform decisions on forest and land use. The measures outlined in this report aim to accelerate growth and sustainability, supporting Indonesia's transition towards Golden Indonesia 2045.

¹³ Based on MODIS Burned Area satellite data (2001–2022) and MoFor Forest and Land Fire Early Warning and Detection system data (2018–2023).

¹⁴ Source: Observatory of Economic Complexity (OEC) Database (2022) ([link](#)); World Integrated Trade Solution Database (2022) ([link](#)); and TradeMap Database (2022) ([link](#)).

¹⁵ Despite their ecological alignment, the GDP

“

Nationwide, the ecosystem services provided by forests are estimated to be worth approximately

US\$ 2,100

— US\$ 5,200/ha/yr

ACKNOWLEDGMENTS

This report was prepared by a joint research team from the World Bank, the Ministry of Forestry (MoFor), and the Ministry of Finance (MoF), through the *Evaluating and Realizing the Value of Indonesia's Forest Ecosystems Research Initiative*. Dr. Alue Dohong (Vice Minister of Environment and Forestry, 2019-2024) provided overall motivation, guidance, and leadership.

The MoFor team was led by Prof. Haruni Krisnawati (Senior Advisor on Climate Change). Inputs were received from Prof. Satyawan Pudyatmoko (Director General of Nature Resources and Ecosystem Conservation), Jefry Susyafrianto (Director of Conservation Area Management), Nunu Anugrah (Director of Biodiversity), Nandang Prihadi (Director of Environmental Services Utilization), Ammy Nurwati (Secretary of Directorate General of Nature Resources and Ecosystem Conservation), Indra Exploitasia (Head of Human Resources Development), Novia Widianingtyas (Senior Advisor on Forest Industry Revitalization), Fahrizal Fitri (Senior Advisor on Inter-institutional Relations), Ishak Yassir (Head of Data and Information Center), and Krisdianto (Head of Public Relations and International Cooperation).

Erik Teguh Primiantoro (Minister's Senior Advisor on International Relations and Environmental Diplomacy, Ministry of Environment) and Edi Sulistyono (Head of Planning Bureau, MoFor) provided assistance with the official forestry data.

The MoF team comprised Arik Hariyono (Director of Valuation) and Nella Hendriyetty (Advisor to the Director General for State Asset Optimization), with guidance from Rionald Silaban (Director General of State Asset Management) and Joko Tri Haryanto (Executive Director, Indonesia Environment Fund).

The World Bank team comprised David Kaczan (Senior Economist), Marissa Malahayati (Environmental Economist), Nariswari Nurjaman (Environmental Economist Consultant), Lucio Scandizzo (Professor of Economic Policy, University of Rome Tor Vergata, World Bank Consultant) and Daniele

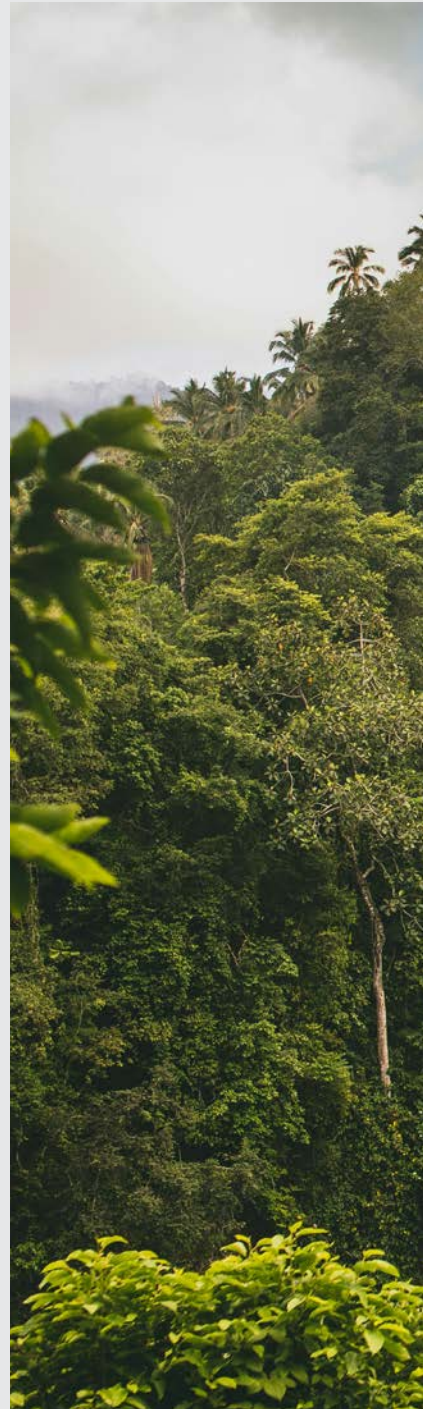
Cufari (Researcher, University of Rome Tor Vergata, World Bank Consultant).

The mapping of ecosystem services was developed by a team from Impact House (Grant Thornton) comprising Stijn Schep (Senior Consultant), Žiga Malek (Spatial Analysis Expert), Elena Palacios (Consultant), Chris Duinmeijer (Consultant), Judd Maza (Consultant), and Luke Brander (Ecosystem Services Valuation Advisor). Inputs on carbon markets were provided by Rob Smith (Environmental Economics Consultant, World Bank). Inputs on biodiversity were provided by Emil Pradana (Climate Policy Consultant, World Bank).

Further technical contributions were obtained during consultations with the Ministry of Forestry, Ministry of Finance, Statistics Indonesia, and the Geospatial Information Agency. Technical reviews were provided by Luis Diego Herrera Garcia (Environmental Economist), Raffaello Cervigni (Lead Climate Change Economist), Muthukumara S. Mani (Lead Environmental Economist), Rong Qian (Senior Economist), Dayu Nirma Amurwanti (Senior Natural Resources Management Specialist), Bekele Ambaye Shiferaw (Senior Environmental Economist), and Carolyn Turk (Country Director, Indonesia), all of the World Bank. The editing was by Zubair Qamar. Design was by Kamal Muhammad.

From the World Bank, the team thanks Carolyn Turk (Country Director, Indonesia), Bolormaa Amgaabazar (Operations Manager, Indonesia), Christophe Crepin (Practice Manager), Ann Jeanette Glauber (Practice Manager), Vikas Choudhary (Lead Agriculture Specialist), and Franka Braun (Lead Environmental Specialist) for support. The team also thanks Krisdiyanto (Head of Public Relations and Foreign Cooperation Bureau, MoFor) for support.

Funding was provided by the Indonesia Sustainable Landscape Management Multi Donor Trust Fund (SLM-MDTF), housed at the World Bank and generously supported by the Governments of Norway and Australia.







KEMENTERIAN KEUANGAN

Supported by:

