

Measures to Enhance Forest Conservation and Reduce Deforestation

Viewpoints and lessons from producing countries

SSI REPORT



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Measures to Enhance Forest Conservation and Reduce Deforestation: Viewpoints and Lessons from Producing Countries

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Written by Florencia Sarmiento, Cristina Larrea, Andreas Oeschger, and Rashmi Jose

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Executive Summary

Deforestation is a complex issue that has gained prominence in worldwide political agendas, sparking a wide array of measures, public and private, that aim to enhance forest conservation. In this regard, this paper seeks to illustrate examples of measures that Costa Rica, Peru, Rwanda, Indonesia, and Gabon, agriculture commodity-producing countries in the Global South, have put in place to address deforestation while exploring the potential synergies with voluntary sustainability standards (VSSs).

Addressing deforestation requires a strategy that includes many complementary measures, and in designing such measures, it is useful to learn from the experiences of governments that have implemented different measures or approaches.

The experiences of the selected countries can provide useful starting points for governments in the Global South seeking to preserve their forests and comply with emerging regulations and international frameworks that target deforestation-free commodity production, as well as forest conservation and restoration more broadly.

The following are key takeaways that draw upon insights from our analysis of the five case studies:

- Reducing deforestation and improving forest conservation requires a combination of measures that respond to the country's context and address the causes of deforestation.
- Measures to enhance forest conservation and address deforestation need to target areas that are at high risk of deforestation.
- Recognizing the economic and environmental value of forests is critical for reversing deforestation, restoring land, and preserving forests as part of a long-term government commitment and strategy.
- An enabling environment is required to support producers, forestry operators, and smallholders in complying with policy measures that prevent deforestation and enhance forest conservation.
- Engaging with multiple actors and mobilizing funds from both the public and private sectors to support efforts to reduce deforestation and enhance forest conservation are important methods to achieve results across various scales.
- VSSs can complement and support the implementation of measures to enhance forest conservation and reduce deforestation.
- A combination of both physical and digital monitoring can help ensure the proper implementation of the measures while allowing for real-time monitoring and obtaining meaningful information on forests and biodiversity inventories.



Report Objective

The objective of this paper is to illustrate different measures that agriculture commodity-producing countries in the Global South can put in place to reduce and reverse deforestation while exploring potential synergies with voluntary sustainability standards (VSSs) based on successful initiatives and lessons learned from the experiences of five countries: Costa Rica, Gabon, Indonesia, Peru, and Rwanda. These measures can provide useful starting points for governments in producing countries seeking to preserve their forests and comply with emerging regulations and international frameworks that target deforestation-free commodity production, as well as forest conservation and restoration more broadly.¹ Moreover, the report explores how these implemented measures can be used in conjunction with VSSs in order to support producers transitioning to more sustainable operations that preserve forests and reduce deforestation.

To do so, the report starts with a brief introduction and proceeds as follows: Section 2 presents an overview of different environmental measures that can address deforestation and categorizes them based on the type of measure according to the intended objective and the actors involved. Section 3 showcases how these measures have been applied in practice in the five countries, offering a detailed analysis of their experiences in addressing deforestation domestically, including implementation, monitoring mechanisms in place, and results yielded. Drawing from the analysis laid down in Section 3, Section 4 concludes by highlighting viewpoints and lessons learned from these experiences.

Methodology

The selection of countries for this policy report was guided by three primary criteria, encompassing considerations of (1) recovery and the stage of forest preservation, (2) geographic distribution, and (3) risk of deforestation.

1) Recovery and the stage of forest preservation

Countries were chosen based on their different experiences with deforestation to represent various stages of recovery. The selected case studies include producing countries that have successfully reduced deforestation and those actively engaged in efforts to address deforestation and forest conservation.

2) Geographic distribution

The chosen countries span different continents, ensuring the analysis of regional variations in deforestation responses.

¹ These emerging regulations and frameworks include due diligence regulations, provisions in free trade agreements, corporate pledges (such as zero-deforestation commitments), and other regulatory measures (including moratoriums on large-scale plantation expansions) (Ingram et al., 2020; Larrea et al., 2021; Mosnier et al., 2017).



3) Deforestation risk

The selected producing countries also represent different deforestation risks. Some have demonstrated successful efforts in reducing deforestation, while others are currently undertaking proactive measures to prevent deforestation. Additionally, some are considered “high risk,” as they are facing imminent threats or challenges to their forest ecosystems.

Research Limitations

It is important to note that the present report does not assess the transferability of successful measures to other contexts. Further research is essential to explore and assess the extent to which some of the measures included in this report can be scaled out and serve as a model or measure in other producing countries.

Consequently, this report provides for generalized lessons learned based on the analysis of the selected countries’ experiences to inform other governments seeking to develop their own measures to preserve forests and comply with international frameworks addressing deforestation.



Table of Contents

1.0 Introduction	1
2.0 An Overview of Measures to Address Deforestation	6
3.0 Deforestation Measures in Producing Countries	10
3.1 Costa Rica: Payment for ecosystem services.....	10
3.2 Gabon: Mandatory compliance with private certification.....	17
3.3 Indonesia: National certification scheme	27
3.4 Peru: Land use formalization.....	35
3.5 Rwanda: Forest landscape restoration strategy.....	41
4.0 Key Takeaways for the Design and Implementation of Measures to Enhance Forest Conservation and Reduce Deforestation.....	48
References	56
Appendix A. Voluntary Sustainability Standards	72

List of Tables

Table 1. Country profiles.....	8
Table 2. Classification of producing countries' measures	9
Table 3. Forest definitions by country	50
Table A1. Examples of criteria coverage of a number of VSSs	73

List of Boxes

Box 1. Mandatory due diligence regulations to address deforestation.....	3
Box 2. Overview of policy measures and approaches that can address deforestation.....	6
Box 3. Principles of the FSC standard.....	20
Box 4. Seven lessons learned.....	48



Abbreviations and Acronyms

AfC	Agroforestry Concession
ARFFS	Autoridad Regional Forestal y Fauna Silvestre
EU	European Union
FACT Dialogue	Forest, Agriculture and Commodity Trade Dialogue
FAO	Food and Agricultural Organization of the United Nations
FLR	forest landscape restoration
FLROA	Forest Landscape Restoration Opportunities Assessment
FMP	forestry management plan
FONAFIFO	National Fund for Forest Financing (Fondo Nacional de Financiamiento Forestal)
FSC	Forest Stewardship Council
GGGI	Global Green Growth Institute
GIS	geographic information system
HCV	High Conservation Value
ISPO	Indonesian Sustainable Palm Oil
IUCN	International Union for Conservation of Nature
PES	payments for ecosystem services
RSPO	Roundtable for Responsible Palm Oil
SIMOCUTE	Sistema Nacional de Monitoreo de la Cobertura y Uso de la Tierra y Ecosistemas
SINAC	Sistema Nacional de Areas de Conservación (National System of Conservation Areas)
UN	United Nations
UNDP	United Nations Development Programme
UNFSS	UN Forum on Sustainability Standards
VSSs	Voluntary Sustainability Standards



1.0 Introduction

Forests are essential to human life: they mitigate climate change and preserve biodiversity. But they are threatened by deforestation and forest degradation activities.

Forests and trees sustain and protect us in invaluable ways: they provide essential environmental services, such as clean oxygen and safe water; they harbour more than three quarters of terrestrial biodiversity; and they contribute directly to national incomes and the local livelihoods of millions of people worldwide (Oldekop et al., 2020). They also regulate important aspects of the global carbon cycle by capturing about 2.6 billion tonnes of carbon dioxide every year and regulate weather patterns by exhaling the water they absorb from the soil into the atmosphere, which can help balance atmospheric heat and generate precipitation (Anderegg et al., 2019).

These essential functions of forests mean they can play crucial roles in addressing and combatting looming environmental crises, such as climate change and biodiversity loss. Halting deforestation and maintaining forests could avoid emitting 3.6 +/- 2 Gt of carbon dioxide equivalent per year between 2020 and 2050, equivalent to about 14% of what is needed to mitigate carbon emissions up to 2030 to keep planetary warming below 1.5°C while safeguarding more than half the Earth's terrestrial biodiversity (Food and Agricultural Organization of the United Nations [FAO], 2022).

About 10,000 years ago, at the end of the last great ice age, 6 billion ha of forests covered 45% of the Earth's land (United Nations [UN] Department of Economic and Social Affairs, 2018). Today, global forest coverage has diminished to 31% (or 4.06 billion ha), and the area continues to shrink. Since 1990, the world has lost 420 million ha of forest—an area bigger than India—and, even though deforestation rates have slowed in the last couple of decades, the world lost 10 million ha of forest—about the size of Iceland—between 2015 and 2020 (FAO, 2020a).

According to the FAO, agricultural expansion—cropland and livestock grazing—drove almost 90% of global deforestation in the period 2000–2018 (FAO, 2022). Other main drivers of deforestation include logging, fires, urbanization, and energy infrastructure, as well as mining and oil exploitation (FAO, 2007, 2022a; Ritchie & Roser, 2021). Another recent study conducted using satellite imagery suggests that in the period 2001–2015, global permanent land-use change for commodity production was responsible for 27% of global forest loss (Curtis et al., 2018). Most permanent deforestation happens in tropical forests, with cattle ranching, soybean, and oil palm accounting for 40% of tropical deforestation. Cocoa has also been an important driver of deforestation in West Africa (Bermudez et al., 2022; FAO, 2020a). In temperate and boreal forests, forestry operations and wildfires were the main causes of temporal forest loss (Curtis et al., 2018).



Realizing the urgency of preventing further deforestation and forest degradation, as well as associated problems, policy-makers included the issue in the 2030 Agenda for Sustainable Development. Sustainable Development Goal 15 specifically calls on countries to “protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss” by 2030 (UN, 2015). However, despite growing progress on this goal in the last decade, 145 governments worldwide felt the need to “accelerate action” and have signed the 2021 Glasgow Leaders’ Declaration on Forests and Land Use. This declaration includes a pledge “to halt and reverse forest loss and land degradation by 2030 while delivering sustainable development and promoting an inclusive rural transformation” (UN Climate Change Conference UK 2021, 2021).

Moreover, the Forest, Agriculture and Commodity Trade Dialogue (FACT Dialogue) was established in Glasgow. The FACT Dialogue is a government-to-government dialogue that brings together 30 of the “largest producers and consumers of internationally traded agricultural commodities [associated with deforestation] (such as palm oil, soya, cocoa, beef, and timber) to protect forests and other ecosystems while promoting sustainable trade and development and addressing the climate and biodiversity crises” (FACT Dialogue). Most recently, in 2022, when countries adopted the Kunming-Montreal Global Biodiversity Framework, in Target 10 they included that countries commit to action to “ensure that areas under agriculture, aquaculture, fisheries and forestry are managed sustainably,” which needs “to be initiated immediately and completed by 2030” (Convention on Biological Diversity, 2022).

Multiple actors are increasingly addressing deforestation through different measures, such as international regulation, corporate commitments, and voluntary sustainability standards (VSSs).

In this context, both the public and private sectors are increasingly taking different measures to help preserve forests that are vital ecosystems. We can categorize these measures by considering the leading actors that are initiating them into public-led measures, private-led measures, and measures led by private–public partnerships.

Examples of public-led measures include domestic regulations in producing and consuming countries, multilateral instruments, and forest conservation provisions in free trade agreements. Notably, a widely debated public-led policy approach recently proposed by some governments is introducing mandatory due diligence regulations targeting supply chain actors to reduce commodity-driven deforestation and forest degradation (Oeschger & Sarmiento, 2022) (see Box 1).



Box 1. Mandatory due diligence regulations to address deforestation

A growing number of governments worldwide have started to explore or implement regulations that impose mandatory due diligence, requiring companies to conduct due diligence on their operations and those of their suppliers to identify, prevent, mitigate, and account for potential risks or actual adverse impacts on people and the planet.

Mandatory due diligence regulations are seen as a way to address environmental and social issues in global supply chains, including deforestation, human rights abuses, and labour violations that affect communities and ecosystems around the world. By requiring companies to conduct due diligence and take steps to address these issues of concern, governments aim to promote more sustainable and responsible business practices, greater transparency, and accountability in supply chains. The European Union (EU)² has driven the adoption of mandatory due diligence regulation, but it has also appeared in discussions in other places, such as Canada and Australia.

Governments have started to discuss and introduce specific deforestation-focused mandatory due diligence regulations that require companies to identify and mitigate risks of deforestation in their supply chains. Under such laws, companies must carry out a comprehensive risk assessment of their supply chains to identify areas where deforestation may be occurring or could potentially occur in the future. Companies are also required to develop and implement strategies to mitigate this risk and ensure that their supply chains are free from deforestation (Oeschger & Sarmiento, 2022).

Mainly European states are adopting deforestation-focused mandatory due diligence regulations, though this issue has also been discussed in the United States (Sen. Schatz, 2021). In 2021, the Forest Act was introduced in the U.S. Senate. Although it has not yet gone up for a vote, the entry into force of the EU regulation may reignite the discussions. In November 2021, the British government adopted a regulation that introduced mandatory due diligence requirements regarding deforestation risks for companies operating in the country. In 2023, the EU regulation on deforestation-free supply chains entered into force. The regulation builds on three pillars: a focus on relevant commodities and products, a mandatory due diligence procedure coupled with strict traceability, and a risk benchmarking system for countries and/or regions (Oeschger & Sarmiento, 2022).

All mandatory due diligence regulations adopted by different countries to address deforestation issues share common goals and propose similar measures. These include conducting assessments to identify and assess the risks of deforestation in their supply chains (i.e., designing a risk assessment tool), performing due diligence to address the risk of deforestation (i.e., gathering information about the origin of commodities,

² In 2017, France adopted a law requiring companies to establish and implement a vigilance plan to identify and prevent human rights abuses and environmental harm in their operations and supply chains, including deforestation. In June 2021, Germany adopted a similar law that requires companies to conduct due diligence on their supply chains to prevent and address human rights abuses, environmental harm (including deforestation), and corruption; it entered into force in January 2023. In 2022, the EU proposed a new regulation on sustainable corporate governance that includes provisions on mandatory due diligence to prevent human rights abuses and environmental harm, including deforestation, in global supply chains.



conducting site visits), and implementing mitigation measures (i.e., sourcing from sustainable sources using traceability systems).

However, they also differ from each other in many ways, most importantly, regarding scope (i.e., the definition of deforestation and deforested ecosystems, targeted commodities, and sectors), the size of companies covered, enforcement mechanisms (i.e., civil or criminal penalties for noncompliance, exclusion from public procurement), and specific requirements (i.e., the existence of grievance mechanisms, public reporting).

The adoption of mandatory due diligence regulations to address deforestation in global supply chains by consuming countries can open opportunities for producing countries in the Global South. For instance, by requiring due diligence regarding certain key sustainability issues, these regulations can support accelerating and scaling up the implementation of sustainable land-use practices, more resilient production systems, and the use of technology. They can potentially increase market access, command premium prices for their commodities, or attract investment and development assistance from international donors and financial institutions that are committed to responsible forest management and sustainable production that prioritize conservation and the restoration of natural resources.

However, these regulations have also raised concerns among producing countries as they can present challenges and have negative effects on their economies.³ Notably, a decision by importing companies to reduce or cease purchases due to deforestation concerns may directly lead to job losses and even economic instability in producer countries. Implementing due diligence requirements also demands significant resources and expertise, which may be challenging and costly for producers, especially for smallholders and small or medium-sized enterprises that have limited resources.

Furthermore, mandatory due diligence regulations may not sufficiently address the root causes of deforestation, such as weak land tenure systems, poverty, a lack of law enforcement, and political instability. Finally, complying with these new regulations may lead to even more challenges as they could conflict with national laws or other international regulations.

Private-led measures include corporate pledges and their corresponding implementation plans and monitoring systems and VSSs, which require participating producers and operators to comply with verifiable or certifiable environmental and social production requirements (Larrea et al., 2021).

Lastly, examples of public–private partnerships are the Cerrado Manifesto on soybeans in Brazil, the Cocoa and Forest Initiative in West Africa, and some landscape or jurisdictional approaches that aim to shape more sustainable commodity production practices in a given territory involving different value chain actors and local governments across sectors (Ingram et al., 2020).

³ See, for instance, the joint letter submitted by Indonesia and Brazil to the WTO's Committee on Agriculture on November 28, 2022: <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/G/AG/GEN213.pdf&Open=True>



VSSs are largely private-led measures that, when designed and implemented properly, can help achieve positive results as part of broader efforts to tackle deforestation and preserve forests.

VSSs are largely private-led measures that actors across the world have created to advance sustainable production practices, including forest conservation and deforestation prevention. The UN Forum on Sustainability Standards (UNFSS, 2013) defines VSSs as “standards specifying requirements that producers, traders, manufacturers, retailers or service providers may be asked to meet, relating to a wide range of sustainability metrics, including respect for basic human rights, worker health and safety, the environmental impacts of production, community relations, land-use planning and others” (see Appendix A).

Numerous studies into the effects of VSSs on protecting forests and reducing deforestation reveal that they have had mixed results; they report that their results are context specific and highly dependent on location. The results also vary across commodities (Carlson et al., 2018; Ingram et al., 2020; Marx et al., 2022). Nevertheless, when examining the effectiveness of different public and private measures to reach the objective of zero-deforestation value chains, including regulations, public–private partnerships, landscape and jurisdictional approaches, and due diligence mechanisms, Ingram et al. (2020) found that there are VSSs that have “the most demonstrated positive impact in preventing deforestation,” especially at the farm and plantation level. This suggests that when designed and implemented properly, VSSs can help achieve positive results as part of broader efforts to tackle deforestation and preserve forests.

Indeed, the study suggests that a more effective approach to tackling deforestation involves combining different strategies that address various deforestation drivers and pathways across different spatial and temporal scales. This requires cooperation among different stakeholders, both public and private, and the implementation of multiple strategies that compensate for the respective limitations of different actors and initiatives working in isolation. A multilevel, multi-intervention approach is needed to achieve this, which involves systematically analyzing different combinations of interventions on both the production and consumption sides of value chains to make the best use of the strengths of each approach while balancing their weaknesses (Ingram et al., 2020). A multi-layered approach may also be the best strategy to target the individual, context-sensitive drivers of deforestation and forest degradation (Hosonuma et al., 2012). Studies also show that rigorous policies can be implemented without endangering the future growth of agricultural production (Mosnier et al., 2017).

While several studies have examined different public and private measures to halt deforestation, this policy brief will focus on the implementation of public-led deforestation measures that are now being implemented in the Global South by commodity-producing countries. In particular, the brief will look at existing or potential synergies of these public-led measures with VSSs as a way to combine different tools to maximize efficiency.



2.0 An Overview of Measures to Address Deforestation

Governments have different choices available when addressing environmental issues, including reducing deforestation and enhancing forest conservation. In this regard, the five countries we have examined—Costa Rica, Gabon, Indonesia, Peru, and Rwanda—have been engaging at the domestic level to halt deforestation and have adopted different policy measures to this end. These measures include payments for ecosystem services (PES), land tenure systems, national certification schemes, forest landscape restoration (FLR) strategies, sustainable forest management, and value addition through certification (see Box 2).

Box 2. Overview of policy measures and approaches that can address deforestation

Payments for ecosystem services

PES refer to payments made to farmers or landowners for specific land management practices that provide ecological benefits. PES is a market-based mechanism similar to a subsidy that incentivizes landowners and managers to conserve natural resources. The scheme typically involves forest owners or farmers who receive payments for managing and protecting their resources to support forest and watershed conservation, biodiversity preservation, or carbon sequestration. This protection can include practices such as tree replanting, maintaining existing trees, or adopting alternative agricultural methods (International Institute for Environment and Development, 2023; Jack et al., 2008).

Land tenure systems

Land tenure systems regulate how individuals and groups gain access to land and natural resources, determining associated rights and responsibilities. Effective governance of tenure is critical to achieving sustainable land use, including sustainable forest management and forest conservation, as insecure tenure rights can discourage long-term investment in sustainable land-use practices (Finnegan, 2016). The FAO produced the Voluntary Guidelines on the Responsible Governance of Tenure, which provide guidance on how countries can reform and strengthen land tenure systems and secure the rights of local communities, Indigenous Peoples, and smallholders. This process may involve legal recognition of customary land rights, implementation of land-titling programs, and protection of communal or collective lands. Reforming land tenure systems should also include measures for enhanced tenure governance, enforceability, and effective rule of law (FAO, 2022b).



National certification schemes

Governments have established national sustainability standards, also known as certification schemes, to guide and certify production processes. These national sustainability standards, sometimes also set up at the regional level, are increasingly developed to adapt international standards to the local context (UN Conference on Trade and Development, 2023). Among these certification schemes are those related to forest protection. These national certification schemes are “voluntary [or mandatory] process[es] whereby an independent third-party assesses the quality of forest management and production against a set of requirements predetermined by a public or private certification organization” (FAO, 2023).

Forest landscape restoration

FLR is a planned, long-term “process that aims to regain ecological integrity and enhance human well-being in deforested or degraded forest landscape” (Rietbergen-McCracken et al., 2008). Developed by the International Union for Conservation of Nature (IUCN) and the World Wildlife Fund in the 2000s, FLR represents a policy framework that links forest restoration and conservation with sustainable land and forest management (IUCN, 2020a).⁴ FLR is intended to be more comprehensive than conventional restoration approaches and involves a combination of activities, such as planting new trees, managing existing forests, supporting natural regeneration, and working with local communities to promote sustainable land use practices (Rietbergen-McCracken et al., 2008; World Resources Institute, 2014).

Sustainable forest management and value addition through private certification

According to the FAO: “Forest management is the process of planning and implementing practices for the stewardship and use of forests to meet specific environmental, economic, social, and cultural objectives. It deals with the administrative, economic, legal, social, technical, and scientific aspects of managing natural and planted forests.” Sustainable forest management constitutes “the sustainable use and conservation of forests with the aim of maintaining and enhancing multiple forest values through human interventions” (FAO, 2020d). In this regard, governments can use private certification schemes focused on forestry operations to advance sustainable forest management and strengthen their national policy and regulatory frameworks while developing more advantageous international market opportunities for their forestry operators that add economic value to forest conservation.

The policy measures and approaches mentioned above represent just a few of those that governments in these five countries have implemented as part of broader strategies to address deforestation. These strategies include establishing protected areas and implementing legal measures such as bans, prohibitions, or fines to deter illegal logging or land clearance. They are also mentioned in the case studies below.

⁴ According to research, more than 2 billion ha worldwide—an area larger than South America—offer opportunities for forest restoration, and thus FLR (World Resources Institute, 2014). Note: Due to a lack of consensus on FLR as a concept, some key FLR principles defined by the World Resources Institute have been widely adopted as a definition of FLR in practice (Stanturf & Mansourian, 2020; World Resources Institute, 2024).



All these measures can be considered environmental policies and can be further classified according to their aims and objectives. In this regard, different classifications of environmental policy responses have been put forward.⁵ As the objective of seeking to influence human behaviour is a common feature of most environmental policy instruments, including those that tackle deforestation, we engage the classification of Börner and Vosti (2013), which distinguishes between enabling measures, incentives, and disincentives.

Enabling policy measures contribute to establishing general conditions that are conducive to good behaviour driven largely by private aims to achieve a given environmental objective. For instance, VSSs guide and train producers and value chain actors to adopt production practices that respect the environment and enhance community well-being. They can offer opportunities to access markets, direct links with buyers, and better prices.⁶ In turn, incentive-based policy measures provide for direct and specific incentives that change behaviour in ways that contribute to achieving a given objective. Examples of incentives include subsidies, payments, premiums, and access to markets. Conversely, disincentive-based policies provide for specific disincentives that change behaviour, such as bans, taxes, and user fees (Börner & Vosti, 2013).

As mentioned above, this paper focuses on five countries from different regions with different profiles: Costa Rica, Indonesia, Gabon, Peru, and Rwanda (see Table 1). We selected them after considering their deforestation rates and forest restoration track records in an effort to illustrate different experiences and approaches to enhancing forest conservation and addressing deforestation. We have classified each of the policy measures based on the leading actors and their nature according to whether it is an incentive, a disincentive, or an enabling measure. Three of these policy measures are cross-sectoral, while two target specific commodity sectors.

Table 1. Country profiles

Country	Primary forest cover	Population	Agricultural export level	Deforestation risk
Costa Rica	Low	5,094,118	Medium	Low
Peru	Medium	32,971,854	Low	High
Indonesia	Medium	273,523,615	Low	High
Gabon	High	2,225,734	Low	Low
Rwanda	Low	12,952,218	Medium	Low

Source: Authors' elaboration based on Mongabay (2022) and UN Conference on Trade and Development (2023).

NB: Low: 0–35%; Medium 35%–65%; High 65%–100%

⁵ See, for instance, the European Environment Agency's classification of policy interventions in traditional regulatory approaches, market-based instruments, and awareness raising. <https://www.eea.europa.eu/themes/policy/intro>

⁶ Standards may also be considered as an incentive-based policy measure since market demand and direct links with buyers, and increased prices are also perceived as incentives for VSSs uptake. See Elder et al. (2021) p. 80.



Table 2. Classification of producing countries' measures

Country	Measures	Type	Type by nature
Costa Rica	PES	Public	Incentive
Peru	Land use formalization	Public	Enabling
Indonesia	Mandatory national public certification for growing palm oil	Public	Enabling/incentive
Gabon	Mandatory compliance with private Forest Stewardship Council (FSC) certification to obtain forest management concessions	Public/private	Enabling/incentive
Rwanda	FLR strategy	Public/private	Enabling

Source: Authors' elaboration based on an analysis of each measure.



3.0 Deforestation Measures in Producing Countries

This section analyzes the five measures the selected countries have put in place to reduce deforestation and enhance forest conservation. Each country case study is organized as follows: (1) background information, (2) an overview of the main characteristics of the measure, (3) the implementation and monitoring mechanisms, and (4) a summary of the results.

3.1 Costa Rica: Payment for ecosystem services



3.1.1 Country Context

Costa Rica has experienced one of the highest rates of deforestation worldwide (Kleinn et al., 2002). In 1950, forests covered more than half of Costa Rica. By 1995, forest cover had declined to 25% of the national territory. The primary reason for such a decline was inappropriate policies, such as cheap credit for cattle, land-titling regulations that incentivized deforestation, and the rapid expansion of the road system (Pérez, 2009; United Nations Framework Convention on Climate Change, n.d.). Thanks to structural changes in the economy and the priority given to forest conservation and sustainable management, Costa Rica has become one of the world's leading proponents of environmentally sustainable development (FAO, 2022).

Costa Rica's deforestation was one of the highest in the world and peaked in the 1980s (FAO, 2016). Yet Costa Rica is considered the only tropical country in the world to have reversed deforestation, with its highly biodiverse tropical rainforests now covering close to 60% of the country. This was possible due to a combination of several policy measures that include the establishment of a system of protected areas, PES programs that provide financial rewards to landowners protecting their forests, and ecotourism that aims to



increase local economic gains and protect biodiversity while minimizing detrimental ecological effects from tourists (Tafoya et al., 2020). All these measures respond to the government's commitment to reforestation and forest preservation. Among the different policies implemented by Costa Rica is the Payments for Ecosystem Services (PES) Program, which aims to promote forest and biodiversity conservation and stands out as a mechanism to combat forest loss (World Bank, 2022a).

3.1.2 Overview of the Measure

The PES program rests upon a legal framework comprising the 1995 Environment Law 7554, which mandates a “balanced and ecologically driven environment” for all; the 1996 Forestry Law 7575, which mandates “rational use” of all natural resources, prohibits land-cover change in established forests, and requires an approved forest management plan; and the 1998 Biodiversity Law 7788, which promotes the conservation and “rational use” of biodiversity resources (Sánchez-Azofeifa et al., 2007).



Forestry Law 7575 introduced the PES program in 1996 after a stakeholder consultation (Le Coq et al., 2011; Watson et al., 1998). The PES program built on the legacy of past programs instituted in 1970 and 1980 that consisted of the first financial incentives established to protect forests and included tradable bonds and upfront payments to landowners to cover the costs of establishing and maintaining tree plantations (Pagiola, 2008; Watson et al., 1998).

The Forestry Law combined two types of environmental policy responses. First, it banned all conversion of established forests and stated that clearing established forests with intent is illegal and punishable by a prison sentence of up to 3 years (disincentive).⁷

Second, the law introduced the offer of PES (incentive). The Forestry Law explicitly recognizes four environmental services provided by forest ecosystems: (i) mitigation of greenhouse gas emissions; (ii) conservation of the hydrological services, including the provision of water for human consumption, irrigation, and energy production; (iii) biodiversity conservation; and (iv) the provision of scenic beauty for recreation and ecotourism (Pagiola, 2008).

The law also established the National Fund for Forest Financing (in Spanish, Fondo Nacional de Financiamiento Forestal [FONAFIFO]), which provides legal and institutional support for its implementation. According to Article 46, the objective is “to finance, for the benefit of small and medium producers, through credits or other mechanisms to promote forest management, intervened or not, the processes of afforestation, reforestation, forest nurseries,

⁷ See the definition of forest contained in Article 3(d) of 1996 Forest Law.



agroforestry systems, recovery of denuded areas and technological changes in the use and industrialization of forest resources” (FONAFIFO, 2018).

FONAFIFO administers the funding for the program, which is primarily financed by a tax on fossil fuels.⁸ The funding comes from diverse sources, which include

1. **Government funds:** main funding established by law.
 - a. fuel tax: initially a 3.5% percentage of collection, currently a fixed annual amount linked to carbon emissions (average USD 11.6 million per year).
 - b. water tax: 25% of collected revenue.
2. **Private sector:** private funds, mainly from hydroelectric plants.
 - a. includes agreements with the private sector, who contribute to the fund by purchasing Certificates of Ecosystem Services (Certificados de Servicios Ambientales in Spanish).
3. **International banks and bilateral agencies:** mostly used at the beginning to start the program.
 - a. includes loans from the World Bank and smaller grants from the German Development Bank and the Global Environmental Facility (Porras & Chacón-Cascante, 2018).

Through the PES program, FONAFIFO can establish contracts with interested parties for 5 years or 10 years. There are three types of contracts, depending on their objectives: (1) forest protection, (2) reforestation and agroforestry systems, and (3) mixed agroforestry systems. On average, the PES program pays USD 65 per ha per year, depending on the type of contract (FONAFIFO, 2022a).⁹ FONAFIFO has a dedicated unit in charge of guaranteeing the proper functioning of the PES program, including the development of guidelines, technical procedures, statistics, payment processing to beneficiaries of PES contracts, and the evaluation and monitoring of the program (FONAFIFO, 2018).

In terms of implementation, the National System of Conservation Areas (Sistema Nacional de Areas de Conservación [SINAC]) set up by Article 22 of the 1998 Biodiversity Law No. 7788 provides guidelines to define the prioritization criteria for granting the PES contract. SINAC is a Ministry of Environment and Energy program and manages other conservation strategies, including 11 conservation areas. The information generated by FONAFIFO is shared with SINAC in order to include it in the monitoring strategy executed by SINAC. It ensures that the monitoring process is comprehensive and transparent.

As incentive-based policies rely on clearly defined property rights, additional enabling measures were needed. The PES program in Costa Rica has helped formalize land tenure as a precondition for participation and ensure that the program is reaching its intended

⁸ This source of funding may be curtailed in the future as the country moves toward decarbonization of its energy sources (Murguía et al., 2022).

⁹ See 2023 amount of payment for each activity at <https://onfcr.org/monto-por-modalidad>



beneficiaries. As formal title is a requirement, it has incentivized landowners to formalize their land tenure, improving the land titles system (Porrás et al., 2013). In addition to the PES program, in 2020, Costa Rica began pursuing zero-deforestation initiatives with commodity sectors through a national monitoring system that tracks land-use changes in pineapple, oil palm, banana, sugar cane, and cattle landscapes (Furumo & Lambin, 2020).

Several VSSs, such as Bonsucro, GLOBALG.A.P., Fairtrade International, Organic, and Rainforest Alliance, are present in Costa Rica in various sectors, including bananas, cocoa, coffee, oil palm, tea, and sugarcane (Meier et al., 2020). These schemes support practices that prevent deforestation and preserve forests and High Conservation Value Areas (Elder et al., 2021; GLOBALG.A.P, 2022; Larrea et al., 2021; Voora et al., 2022), encouraging farmers to grow coffee and cocoa in agroforestry systems. Through their tools, training, and monitoring practices, they can help producers preserve forests and benefit from the PES Program while supporting the government in achieving its environmental goals. As an illustrative example, a recent study on 30 certified and non-certified farms that grow coffee in agroforestry systems in Costa Rica found that certified coffee farms provide more ecosystem services (i.e., canopy cover, prevention of water pollution, and erosion) than non-certified farms (Pico-Mendoza et al., 2020).

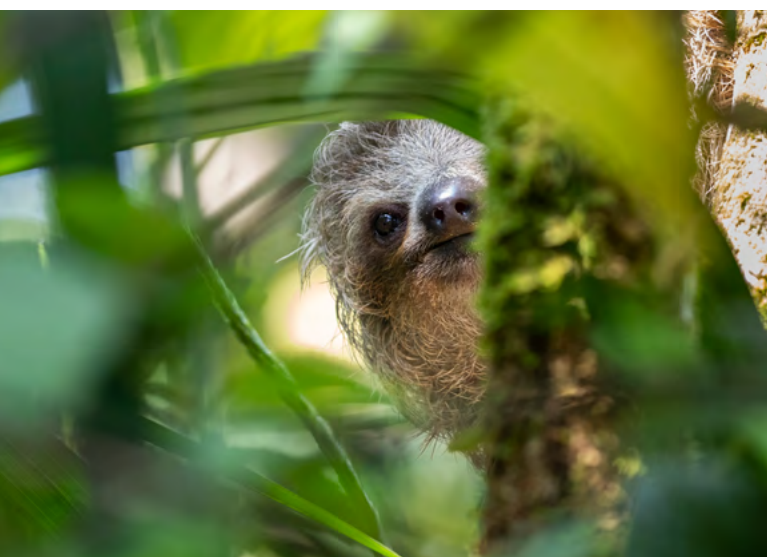
3.1.3 Implementation and Monitoring Mechanisms

In terms of implementation, the first step in the process is to submit a pre-request application form to FONAFIFO.¹⁰ During the period 1997–2010, contracts were allocated on a first-come, first-served basis. However, since the number of requests increased faster than the available funds, a strategy for contract allocation was developed. The criteria for allocation are based on landowner and land-use characteristics and have changed over time. Once selected, the contract is signed for 5, 10, or 16 years for different activities of forest protection, reforestation, sustainable forest management, and agroforestry, with an estimation of the payable amount and a payment schedule. The PES beneficiary must submit a technical study issued by a registered forest technician (*regente forestal*), together with the digital files (in shape file format) of the perimeter of the farm and the effective area of PES to be contracted.

To assess compliance, FONAFIFO designed a monitoring and evaluation scheme for the PES program. Monitoring is carried out through various activities that include FONAFIFO staff's visits to the lands under PES contracts and the review of regency reports provided by the forest regents who monitor forest management plans. Modern technology supports the scheme, which seeks to ensure that the resources invested are used efficiently and reach those who effectively provide environmental services (FONAFIFO, 2018). For example, there is a geographic information system (GIS) used to map forests and monitor canopy cover every 5 years. This information is used by FONAFIFO for monitoring.

In 2015, following a ministerial directive, Costa Rica initiated the establishment of a comprehensive national system to monitor land cover, land use, and ecosystems known as Sistema Nacional de Monitoreo de la Cobertura y Uso de la Tierra y Ecosistemas

¹⁰ The application form is available at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.fonafifo.go.cr%2Fmedia%2F3770%2Fsolicitud_ingreso_al_programa_psa_2023.docx&wdOrigin=BROWSELINK



(SIMOCUTE). This system comprises several integrated subsystems and serves as the official platform for the integration and administration of environmental data and information at the national level (FAO, 2021; SIMOCUTE, 2023). The system, launched in 2015, was the world's first to overlay satellite images with land registry records on an annual basis for an entire national territory. Since then, the system has produced annual maps and images of forest areas and ecosystems showing forest loss and gain from agro-commodity production across Costa Rica (UN Development Programme [UNDP], 2017). It also produces inventories of the type of species and the volumes

or numbers of species/trees. The National Center for Geo-Environmental Information (in Spanish, Centro Nacional de Información Geo Ambiental), which is the unit in charge of the promotion of adequate management of environmental information, leads SIMOCUTE within the context of the National Environmental Information System (Sistema Nacional de Información Ambiental), and FONAFIFO is part of SIMOCUTE.

Legislation establishing the interinstitutional arrangements that shape the operation of this system defines clear roles and responsibilities. SIMOCUTE is implemented through interinstitutional coordination that began with 11 institutions and now includes 25. SIMOCUTE is an all-lands, multipurpose system allowing for the monitoring of natural ecosystems as well as agricultural and biodiversity resources. Additionally, SIMOCUTE considers existing monitoring systems and initiatives in Costa Rica with a view to integrating them into a more robust system. It also contributes to national needs on climate action, allowing for robust and transparent data and information that will enable the country to make decisions and report on its progress at the international level, following countries' pledges under the Paris Agreement (FAO, 2021).

FONAFIFO monitors the implementation of the contracts granted through these different tools. In case of non-compliance, FONAFIFO can terminate the contract, and there are potential sanctions for damages, as well as the suspension of payments.¹¹

¹¹ <https://onfcr.org/wp-content/uploads/Manual-de-Procedimientos-PSA-2020-14-abril-2020.pdf>



3.1.4 Results

Period 1997–2020 (PES Program)

- 1,407,134 ha of forests protected, reforested, regenerated
- USD 565 million disbursed
- 20,137 contracts

In 2022

- Forests cover 60% of total land (up from 32% in 1984)
- First payment for Forest Carbon Partnership Facility: USD 16.4 million

Costa Rica's PES program is one of the oldest programs in the world. Early assessments of the effectiveness of its first phase (1997–2000) revealed that the program did not significantly reduce deforestation (Robalino & Pfaff, 2013; Sánchez-Azofeifa et al., 2007). It was suggested that the program was outperformed by previous policies, such as the creation of national parks and biological reserves and the 1996 Forestry Law. These studies argued that since these policies effectively reduced deforestation, the PES program had limited forest clearing to prevent it, which reduced its overall impact (Sánchez-Azofeifa et al., 2007). Moreover, these studies suggested that the first phase of the program did not explicitly target areas with high deforestation pressure, and payments to areas where average deforestation threats are low may reduce their impact on preserving forests. As a consequence, studies on this first phase of the program's implementation suggested that to improve its effectiveness, payments may need to target areas under high deforestation threat, such as conservation hotspots and biological corridors (Daniels et al., 2010; Robalino & Pfaff, 2013; Sánchez-Azofeifa et al., 2007).

Other research indicates that the initial PES program was poorly targeted, given the enrollment policy of “first come, first served.” In contrast, when analyzing PES that targeted participants in regions and areas that faced a greater deforestation threat in the same period, a net increase in total forest cover was observed. Thus, PES may have heterogeneous impacts, in the sense that it may work in one area but not work or be less effective in others (Arriagada et al., 2012).

The government switched from “first come, first served” and applied environmental criteria for enrollment in the second phase of the program to target areas that responded to the program objectives. A recent study on this second phase concludes that PES can have a greater impact by targeting specific areas (Robalino et al., 2021).

Another study conducted on the latest cohort of participants of the PES program (2016–2020) found a statistically significant decrease in deforestation 1 year after they entered the program, though the effects diminished in subsequent years (Murguía et al., 2022). There could be many reasons for this behaviour among participants. One potential explanation is that farmers were more compliant when they signed the contract with FONAFIFO but became less compliant over time, as they perceived the payments to be secure regardless of their deforestation efforts. The study concludes that because the program contracts are for 5 years and the effect is only significant in the first year, it may be better to shorten the length



of the contract and implement simplified annual contract renewals or other behavioural interventions to reduce non-compliance in subsequent years (Murguia et al., 2022).

A study conducted by the International Institute for Environment and Development and the University of Costa Rica in 2018 suggests that the program tends to reach producers who are better off, while poorer smallholders, such as those who live on state agrarian reform lands, have less access to it (Lansing, 2017; Porras & Chacón-Cascante, 2018). Thus, the program could improve by addressing the barriers that prevent smallholders in marginalized situations from enrolling in it (i.e., land titles) (Lansing, 2017). The study also suggests that the program is oversubscribed and underfunded. This may require improving the competitiveness of the payments and increasing the overall size of the fund (Porras & Chacón-Cascante, 2018).

According to data published by FONAFIFO in 2022, the largest number of contracts are with small producers (less than 50 ha). When considering and including contracts with producers who own less than 100 ha, it represents almost 60% of PES contracts (FONAFIFO, 2022b).

Despite these limitations, the PES program has achieved important results as part of a broader policy and regulatory framework designed to restore and preserve forests and prevent deforestation. Forests covered about 60% of Costa Rica in 2022, up from 32% in 1984 (Díaz & Madrigal, 2016; World Bank, 2022c). The same year, Costa Rica became the first country in Latin America and the Caribbean to receive payments from the World Bank's multi-donor Forest Carbon Partnership Facility as part of the country's Emissions Reductions Payment Agreement. The USD 16.4 million payment was for reducing 3.28 million tonnes of carbon in 2018 and 2019, and two additional payments are expected by the end of 2025 (World Bank, 2022c). This illustrates how addressing deforestation and assigning value added to forests can contribute to securing funding. Furthermore, in 2019, Costa Rica committed to achieving carbon neutrality by 2050, an ambitious goal that the preservation of forests can help realize (UN Climate Change, 2019).

Key Points

- PES is part of a strategy to enhance forest conservation and reverse deforestation.
- Financial incentives complement other measures that reduce deforestation and regulate forest management.
- There are strong enabling conditions: a legal framework, an institutional framework, financial sustainability, and participation of civil society; transparency and credibility; and political support at all levels.
- PES is more efficient, with eligibility criteria targeting priority areas such as biodiversity hotspots/corridors.
- PES uses an advanced digital monitoring system that provides useful information and improves its ongoing evaluation.



3.2 Gabon: Mandatory compliance with private certification



3.2.1 Country Context

According to the latest estimates by the FAO & UNEP (2020), Gabon has 23.5 million ha of forests that cover 91.3% of the country's land area. Gabon is one of six countries in the Congo basin (accounting for 18% of the basin's forests), a densely forested area that is an important source of biodiversity and the largest carbon sink in the world, absorbing even more carbon than the Amazon (World Bank, 2022b).

In addition to high forest coverage, Gabon also has low deforestation rates. The country's annual net forest area change was -0.02% between 2000 and 2010, though this deteriorated to -0.05% from 2010 to 2020 (FAO & UNEP, 2020). While the rates have worsened, they remain very low. Gabon is, therefore, one of the few countries in the world that can claim the rare status of being a high-forest-coverage, low-deforestation country (Mongabay, 2021).

Gabon's success in maintaining high forest coverage has been attributed to a relatively strong economy benefiting from an unusual combination: a low-density and highly urbanized population supported by oil revenue. The discovery of oil in the 1970s had a huge impact on the Gabonese economy. With Gabon's low population density and the benefits of an oil-driven economy, the population was able to urbanize rapidly (Mongabay, 2021).¹² This means that Gabon, unlike other countries in the region, faced relatively less pressure to clear forest areas for agriculture to sustain the livelihood of a rural population (Conseil National Climat, 2021).

¹² While only 30% of the population lived in urban areas in the 1970s, the percentage increased to 90% by 2020.



3.2.2 Overview of the Measure

Gabon recognizes that its reliance on oil to fuel the economy is a problem in the long term. With oil reserves dwindling, in the 2000s, Gabon began to look toward economic diversification strategies as a means for building alternative and more reliable sources to power the economy (World Bank, 2019).

The development of forest goods, notably the timber industry, became an important part of this economic diversification strategy. Importantly, however, the government aims not only to increase the production of forest goods but also to do it in a sustainable manner, with the goal of maintaining high forest coverage (Conseil National Climat, 2020). The government employs a range of strategies to promote a sustainable forestry industry; chief among them are efforts to increase the value addition of raw product and to focus on sustainable forest management efforts. The rationale behind focusing on the value-addition strategy is due to the awareness that treating natural resources as a cheap commodity can result in the resource being poorly managed (Conseil National Climat, 2020).

A range of policy instruments have therefore been used to promote value addition. Important examples include a 2010 export ban on raw logs and the requirement that 100% of the timber be processed in the country (Conseil National Climat, 2021). A new export tax structure that aims to incentivize localized value addition entered into force in 2021. Companies that process their wood once locally will face an export tax duty on the product of 7.5%. Wood that is processed twice locally will only be taxed at 3%, and wood that is processed three times locally will face no export tax duty (Amending Finance Law No. 75, 2020).

Parallel to these policies, the country has implemented regulations focusing on sustainable forest management. The Forest Code was introduced in 2001 to address illegal logging and promote sustainable forest management. It became operational in 2006, creating a contractual framework that requires forestry operators to respect certain governance and management guidelines to receive an exploitation concession, which is a permit to operate in a section of the forest. The code requires logging companies to apply sustainable forest management practices, including low-impact harvesting techniques and longer harvest rotations (minimum 20 years), as well as the requirement to submit 30-year sustainable forest management plans (Conseil National Climat, 2021).

Against this background, in 2018, Gabon's president announced a government decision to require all forest concessionaries operating in the country to become certified under the FSC standard by 2022.¹³ Companies that failed to become certified by that deadline would risk losing access to their logging licences (Conseil National Climat, 2021).¹⁴

Although announced, the policy has yet to be adopted as a formal regulation. The government said the deadline of the "project," initially planned for 2022, would be delayed until 2025 (Ndiaye, 2021). It is unclear whether the government intends to implement the policy as a

¹³ After the military coup in Gabon in 2023, the implementation and evolution of the above-mentioned measures are likely to be affected and remain uncertain.

¹⁴ While referred to as the FSC policy, it is understood that Pan African Forest Certification (PAFC)–Programme for the Endorsement of Forest Certification (PEFC) are also accepted.



regulatory obligation in 2025 or whether the policy will continue as a government initiative without the use of accompanying regulatory instruments.

The requirement for FSC certification is regarded as an example of how VSSs can be used as a measure to expand sustainable forest management while adding value and promoting exports (UNFSS, 2023). The FSC was established in 1993 as a global certification scheme for sustainable forest management targeting timber, non-timber forest products, and ecosystem services. It includes a standard that regulates the sustainable management of natural forests and plantations, as well as a chain-of-custody standard (Potts et al., 2010) that specifies requirements for companies that source, process, manufacture, label, and sell forest-based products as FSC certified (FSC, 2021c). The FSC also sets standards for the accreditation of certification bodies that conduct independent third-party certification of forestry operations and chain-of-custody organizations.

The FSC standard for forest stewardship defines 10 principles and 72 criteria for forest management that is “environmentally appropriate, socially beneficial and economically viable.” These principles and criteria are also the foundation of national FSC standards that are developed to adapt the standard to local contexts and requirements (see Box 3) (FSC, 2023).



Box 3. Principles of the FSC standard

Principle 1 – Compliance with Laws: The Organization shall comply with all applicable laws, regulations and nationally-ratified international treaties, conventions and agreements.

Principle 2 – Workers’ Rights and Employment Conditions: The Organization shall maintain or enhance the social and economic wellbeing of workers.

Principle 3 – Indigenous Peoples’ Rights: The Organization shall identify and uphold Indigenous Peoples’ legal and customary rights of ownership, use and management of land, territories and resources affected by management activities.

Principle 4 – Community Relations: The Organization shall contribute to maintaining or enhancing the social and economic wellbeing of local communities.

Principle 5 – Benefits from the Forest: The Organization shall efficiently manage the range of multiple products and services of the Management Unit to maintain or enhance long term economic viability and the range of environmental and social benefits.

Principle 6 – Environmental Values and Impacts: The Organization shall maintain, conserve and/or restore ecosystem services and environmental values of the Management Unit, and shall avoid, repair or mitigate negative environmental impacts.

Principle 7 – Management Planning: The Organization shall have a management plan consistent with its policies and objectives and proportionate to scale, intensity and risks of its management activities. The management plan shall be implemented and kept up to date based on monitoring information in order to promote adaptive management. The associated planning and procedural documentation shall be sufficient to guide staff, inform affected stakeholders and interested stakeholders and to justify management decisions.

Principle 8 – Monitoring and Assessment: The Organization shall demonstrate that, progress towards achieving the management objectives, the impacts of management activities and the condition of the Management Unit, are monitored and evaluated proportionate to the scale, intensity, and risk of management activities, in order to implement adaptive management.

Principle 9 – High Conservation Values: The Organization shall maintain and/or enhance the High Conservation Values in the Management Unit through applying the precautionary approach.

Principle 10 – Implementation of Management Activities: Management activities conducted by or for The Organization for the Management Unit shall be selected and implemented consistent with The Organization’s economic, environmental and social policies and objectives and in compliance with the Principles and Criteria collectively.

Source: Quoted verbatim from FSC, 2023.



The expectation is that requiring compliance with a well-recognized private standard instead of the nationally developed code would help national firms increase their access to export markets. For example, Gabonese companies can more easily sell their timber products to international buyers worried about reputational risks (i.e., illegal logging or deforestation) if they perceive that compliance with the FSC standard rather than a nationally developed code is a safeguard against such risks. Alternatively, national companies may see their market shares increase because they have met the needs of more sustainability-focused consumers who recognize the FSC label as a way of meeting their consuming preferences.

Recent research on global consumer preferences for FSC-certified products found that 8 in 10 consumers expect firms to ensure that the wood or paper products they source do not contribute to deforestation or biodiversity loss. Furthermore, the study found that 86% of surveyed consumers checked product information to make informed purchase decisions, and over 6 in 10 consumers said they would probably pay more for an FSC-certified product (FSC, 2021a). Other expected benefits include higher prices, better operational capabilities, and improved performance for economic, social, and governance factors in the local community (van Dijk et al., 2020).

In addition to market access benefits, some believe that other potential non-economic benefits are reason enough to promote the uptake of higher standards. Examples of these benefits include better worker conditions, fewer social conflicts, and improved local community relations (Rougier, 2012; van Dijk et al., 2020).

Nevertheless, there is skepticism about the market access benefits that can result from complying with FSC certification. Research suggests that complying with costly private standards does not necessarily translate into an automatic price premium for these products compared to non-certified products. Another concern is that certification may not even expand the company's market share. There is a perception that private standards operating in the forestry sector, such as FSC and PEFC, are better known in Western markets and are not very well-recognized in the fast-growing markets of Asia, to which Gabon also exports. For some companies, the increased investments and costs associated with complying with the standard do not necessarily lead to a higher value or volume of exported goods and could pose a problem for their long-term viability (Rougier, 2012; van Dijk et al., 2020).

3.2.3 Implementation and Monitoring Mechanisms

The government has taken steps since 2018 to promote the uptake of FSC certification in Gabon. The FSC and the government signed a 5-year cooperation agreement (which can be renewed tacitly) in January 2020 that seeks to promote the sustainable management of forests nationally and improve the access of certified forest products to international markets. The agreement targets five priorities: “(1) create an enabling institutional environment for sustainable forest management; (2) provide follow-up and support to forestry operators; (3) raise awareness about sustainable forest management and increase the participation of key actors, including civil society; (4) develop markets for sustainable wood products; and (5) build capacity for sustainable forest management” (UNFSS, 2020; FSC, 2020a). A joint committee comprised of representatives of the Ministry of Water and Forests and the FSC



was created to coordinate and follow up on the implementation of the agreement, as well as evaluate specific actions (UNFSS, 2020; FSC, 2020b).

The FSC is carrying out activities to (i) build the capacity of government authorities to promote and implement pro-FSC measures and actions; (ii) strengthen the local capacity of forest management stakeholders for field implementation and support for technical understanding of compliance processes; and (iii) improve understanding and awareness of the values and benefits of FSC certification at the local, national, and international levels. Activities may be carried out as training, information sessions, and other communication activities (FSC, 2021d).

The government also offers tax incentives to encourage compliance with the FSC standard. The 2020 tax law provides breaks on miscellaneous taxes and duties under the category called “specific tax.” The surface tax (a levy that charges the area under concession) is 50% lower for concessionary operators adopting FSC certification or that of another private standard such as the PAFC/PEFC than for operators that comply only with the national certification Concession Forestière sous Aménagement Durable, a permit that forestry operators must obtain (Amending Finance Law No. 75, 2020).

Another crucial step was the entry into force of the FSC national standard in 2021. FSC’s international standard (the generic principles and indicators) was adopted into a national standard for forest certification (FSC-STD-GAB-02-2020) (FSC, 2021b) in Gabon. Converting the international standard into a national standard results in the use of more targeted indicators and requirements that better reflect local conditions. Such efforts tend to create a more relevant scheme that better reflects the diverse legal, social, and geographical conditions of forests from different parts of the world (van Dijk et al., 2020).

Despite such efforts, many consider the initial goal for all forestry companies to comply with the FSC standard within 4 years as far too ambitious and unrealistic in practice. It was estimated in 2020 that 1.9 million ha of forests were FSC certified, with much of them having been certified before the 2018 announcement. By 2022, that number had only grown slightly to 2.24 million ha (FSC, 2022). The slow pace may be driven by challenges that include the hefty upfront investments and additional resources (i.e., time and human resources) that are needed to transition to compliance, which can be an important problem for some concession operators.

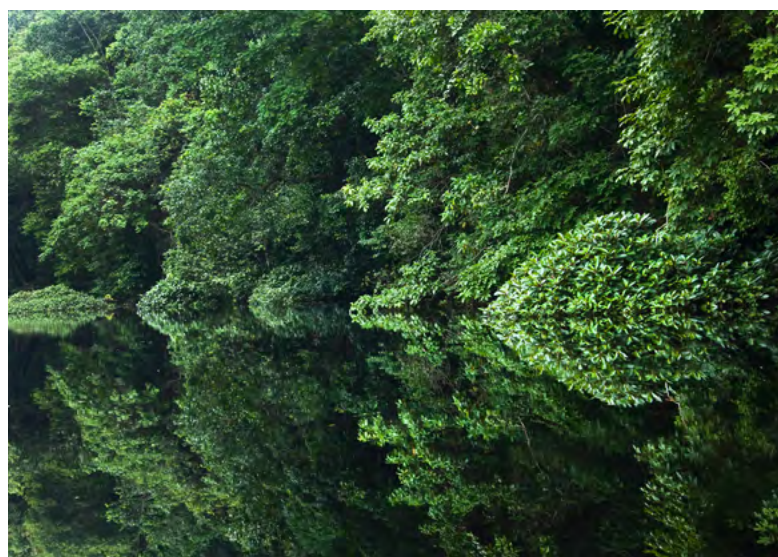
Indeed, adhering to a third-party standard requires fundamental changes in the operational structure of a company, and these changes take a considerable amount of time. Francis Rougier, chief executive of the Rougier Group, one of the main logging companies in Gabon, has detailed his company’s experience with achieving FSC certification, a process it began before the announcement of the FSC policy. Rougier says the process to secure certification was time-consuming, requiring at least 3 years of preparation and maturation. It required a fundamental change in the company’s culture. Local employees had to buy into the strategy and be trained, and time was needed for habits and work practices to change (Rougier, 2012).

The costs associated with achieving third-party certification can also be significant. These can include investments in machinery, staff training, infrastructure, and logistics. The final costs will depend on the gap between the existing level of alignment of the forestry company with FSC principles and requirements and the additional investments needed



to adopt practices compliant with the standard. In addition to these investment costs, the forestry company must also pay the costs associated with the certification process. This includes fees paid to third-party certifiers to conduct audits and prepare reports. These certification costs are regarded as fixed costs that tend to decrease per unit of production as production increases (van Dijk et al., 2020).

The joint committee of government and FSC representatives oversees the implementation of the agreement. In addition, there are measures that help monitor the compliance of forestry operators with the scheme. For instance, forestry companies that comply with the FSC standard must adopt numerous practices that aim to trace the origin of the wood along the value chain and to monitor if the product complies with the FSC standard. Through chain-of-custody approaches, compliant products can be tracked and traced, and volumes are recorded as they move along the value chain. FSC certification holders can use three chain-of-custody models for this purpose: identity preservation, segregation, and mass balance.¹⁵ When the FSC-compliant product faces the market, it is identified with a label that varies depending on the material composition of the final product.¹⁶ FSC-compliant operators can also use a technology that helps determine the species and origin of harvest locations of wood products (Worm, 2020).



In addition to these monitoring and control measures, the FSC conducts audits and monitors the compliance of forestry operations with the scheme every year through field visits and documents. Certification is valid for 5 years. Major incidences of non-conformity need to be addressed before certification is granted, and minor infractions can be corrected within a timeline (FSC, 2019). In recent years, the FSC has set up a satellite and geographic information monitoring system named FSC GIS that enables auditors to monitor compliance with the scheme's principles and criteria remotely and obtain real-time data. This system can be essential for detecting infringement of the standard and illegal logging or unplanned deforestation in their early stages (Larrea et al., 2021). Participation in this initiative is voluntary for compliant operators.

¹⁵ Identity preserved: FSC-compliant products from a specific origin are kept separate so they can be traced back to their source. Segregated: Products from different sources compliant with the FSC standard can be aggregated but must be separated from noncompliant products along the whole supply chain to ensure that end products have 100% FSC-compliant material. Mass Balance: FSC-compliant and noncompliant products are mixed, but as they move through the supply chain, precise figures are kept about the volume ratios (International Institute for Sustainable Development, 2021).

¹⁶ FSC 100%: All materials used in the final product come from responsibly managed FSC-certified forests. FSC Recycled: The product is made from 100% recycled materials. FSC Mix: The product is made with a mix of materials coming from FSC-certified forests, recycled materials, and/or FSC-controlled wood (at most 30%). FSC-controlled wood standards define a minimum set of requirements that non-certified forests are required to meet (i.e., legal harvest, implementation of risk management plans) (FSC, n.d., 2024).



The Gabonese government has also put measures in place to monitor the legality of forestry products and compliance with the FSC. One notable example is a traceability initiative implemented by independent third-party agencies that was set up in 2018 in the Nkok Special Economic Zone. The wood that is processed in this zone must comply with a QR-code tracing system called TraCer. The barcode provides information on the origins of the log, as well as compliance with certain requirements: whether it is FSC certified or complies with national forestry requirements and whether the company has a licence to operate and pays its taxes (Brainforest, 2020). While the tracing has been lauded as being sophisticated, Gabon's Ministry of Water and Forests had to suspend operations temporarily due to corruption concerns (Toto, 2023).¹⁷

The government has also set up a satellite research station that collects images to keep track of changes in land use in Gabon and to help detect and tackle deforestation. In addition to mitigating deforestation, the images are also expected to help identify the already degraded lands that can be used for different economic activities (e.g., palm oil plantations or agricultural expansions). Information will also be collected to estimate the accuracy of data related to carbon stocks and flows, which is critical to making the case for obtaining carbon compensation-based credit schemes (Central African Forest Initiative, 2020; The New York Times, 2022).

3.2.4 Results

- In 2018, 1.9 million ha was FSC certified.
- By 2020, 2.24 million ha was FSC certified (only 15% of the total forest area was under concession).
- Central Africa Forest Initiative (2021): USD 17 million.

As of 2020, around 65% (15.5 million ha) of Gabon's forests were under concession management. Of these 10.7 million ha met the requirements of the national Forest Code (Concession Forestière sous Aménagement Durable), 1.5 million ha was under provisional licences (Convention Provisoire d'Aménagement, d'Exploitation et de Transformation), 1.3 million ha was under permits that were not yet in the management process, and the remaining 2 million ha was under concessions that met not only the Forest Code requirements but also more stringent requirements of third-party voluntary sustainability standards, such as the FSC and the double standards of PEFC–FSC (Conseil National Climat, 2021).

As the agreement has been implemented more slowly than expected, it is difficult to assess the results. Research will be needed to accurately assess the impacts of this measure down

¹⁷ Corruption has become a long-standing concern in the sector, with exports of illegally felled wood remaining a problem despite the ban. Companies may try to evade compliance efforts, either through bribery or leveraging political connections to persuade officials to turn a blind eye. In 2019, nearly USD 8 million of kevazingo, a precious and banned hardwood, was discovered in disguised containers bearing the forestry ministry stamp. The scandal, which was dubbed “kevazingogate,” resulted in the firing of the vice president, the forestry minister, and several high-level civil servants (Toto, 2023). The International Monetary Fund has noted that weak governance and high levels of corruption are among the biggest challenges in Gabon. It recommended additional efforts to close the gap between adopting governance reform efforts and ensuring the actual and effective implementation (International Monetary Fund, 2019).



the road. Nevertheless, Gabon already had an excellent record of forest conservation and a very low deforestation rate before the government introduced this measure. Adopting the FSC scheme may help operators implement their sustainable forest management plans properly and potentially help them access markets and obtain better prices (Marx et al., 2022; Tritsch et al., 2020).

The difficulties experienced in implementing the agreement prompted the government and FSC to launch activities in 2020 to help firms acquire certification. These activities included training forestry professionals and auditors; sharing the costs of High Conservation Value (HCV) Forest assessments with the FSC; helping manufacturers of wood-processing operations in the Nkok Special Economic Zone reach international outlets; expanding market reach; and setting up training activities to mid- to senior-level government officials on the mechanisms and significance of FSC certification. In addition, another strategy has been to enhance chain-of-custody certification to act as a stepping stone toward wider FSC adoption while fostering a greater understanding of the system (Pirard et al., 2023).

Other studies done on the FSC in other countries and regions mainly show positive and neutral results and very few negative results. A 2022 meta-study by Marx et al. summarizes the different impact studies associated with FSC certification found in different databases. The examination of impact studies found in the Evidensia database reveals that 15 studies on the FSC found positive impacts, 13 found neutral impacts, and none found negative impacts. These findings are consistent with the examination of other impact studies found in the Conservation Effectiveness database, which contains 72 impact reports on the FSC—of those, most (40) are positive, 27 are neutral, and five are negative. The study indicates that the FSC appears to have the most positive impact on economic issues, such as higher profits, price premiums, and reduction of pre-logging costs. When examining environmental impacts such as conservation of forest cover specifically, 12 of the 72 impacts are related to positive environmental impacts, 13 are neutral impacts, and one notifies negative impacts.¹⁸ This insight is consistent with the wider literature, which says that FSC certification produces minor positive to neutral results on forest cover change, while more positive results are found when certification is maintained over longer periods of time, as it can protect the forest from competing uses that would have resulted in deforestation (Tritsch et al., 2020).

Many country-level studies exist, but few of the results are generalizable because they are context-specific and can vary widely (Marx et al., 2022). Although not extensive, some research analyzes the impact of FSC certification on reducing deforestation in Gabon and the neighbouring regions. These studies, however, do not analyze the impact of the government's FSC policy; rather, they examine the data of companies that had voluntarily incorporated FSC standards, even prior to the presidential announcement in 2018, which inform the requirement of forests concessionaries to comply with the FSC standard.¹⁹

A 2020 study by Tritsch et al. analyzes forestry management plan (FMP) approval and FSC certification in the Congo basin region and their effectiveness in reducing deforestation.

¹⁸ Most impacts are economic impacts, in terms of affecting price premium, pre-logging costs or profits. Nineteen reports highlight positive economic benefits, seven show neutral impacts, and four show negative impacts. In terms of social benefits, nine are positive benefits, seven are neutral, and none are negative.

¹⁹ The first FSC forest management certificate dates to 2009.



Scrutinizing data from 2000 to 2010, the study concludes that concessions that were FSC certified and had their FMPs approved on a longer-term basis are associated with lower deforestation compared to non-approved FMP concessions from that period. Concessions that were FSC certified at a later period, however, did not produce noticeable effects on deforestation. These results indicate that reduced deforestation is likely to be observed on a long-term basis and not in the short term.²⁰

Panlasigui et al. (2018) studied the impact of FSC certification on forest loss in neighbouring Cameroon. Although the study could not identify any statistically significant differences in forest loss between FSC certified and uncertified concessions, it acknowledges that the result may be due to the time frame of the research. Many concessions had only recently been certified, indicating once again that the FSC does not produce statistically significant short-term results but could do so in the longer term (Panlasigui et al., 2018).

Over the last 3 decades, Gabon has implemented different measures that have helped to protect its forests, add value to its timber industry, and prevent deforestation—obtaining remarkable results. In 2021, the country was the first in Africa to receive funding from the Central Africa Forest Initiative²¹ (USD 17 million) as a payment for reducing emissions and maintaining deforestation at very low levels (UNEP, 2021). Gabon is transitioning to mandatory FSC certification, which could strengthen sustainable forest management practices while opening market access and improving profits, though time and research are needed to assess the actual effects of this measure.

Key Points

- Gabon follows a holistic approach (i.e., combining market and capacity building) to creating an institutional framework.
- A very tight timeline was provided for implementation, and slow adoption of certification has been observed.
- There is a slow capacity-building process to support the adoption of practices that change procedures; organizational culture requires 3 years or more.
- Certification requires high investment costs and uncertain benefits to date as the main client is China, where demand for FSC-certified products has still to grow.
- Weak transparency laws and corruption need to be addressed.

²⁰ The study also hypothesizes five causal pathways as to why FMP approval and FSC certification can reduce deforestation, and why these results can only be observed on a longer-term basis. Three of the causal pathways are improvement in governance practices directly undertaken by logging companies: (i) planning concession through the creation of management series; (ii) planning logging tracks, log landings, and skid trails; and (iii) improved forestry management practices and logging techniques. The two other causes are indirect, in that they are implemented by third-person activities. These are (iv) monitoring of the concession for limiting the expansion of settlement, agriculture, and illegal activities and (v) improving the livelihoods of the local communities.

²¹ The Central African Forest Initiative aims “to support governments in the region to implement reforms and enhance investments to halt drivers of tropical deforestation. Focusing on Central African high-forest cover countries, the Initiative supports country-level efforts for reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks (REDD+) and low emission development investments to mitigate climate change and reduce poverty” (Climate Funds Update, 2019).



3.3 Indonesia: National certification scheme



3.3.1 Country Context

Indonesia is among the top 10 countries with the largest forest area worldwide, accounting for more than 92 million ha of forest area in 2020, which corresponds to 49% of the country's land area (FAO, 2022). Of this, 48.5% is primary tropical forests. However, when comparing these figures with data from 3 decades ago, a sharp decrease in forest coverage can be observed, as the forest area was more than 118 million ha in 1990, corresponding to almost 63% of the total land area (FAO, 2020b).

One of the main drivers of deforestation and forest degradation in Indonesia is palm oil production.²² The country is the biggest exporter of crude palm oil, accounting for almost 50% of palm oil exported globally in 2020. Its export figures are almost 1.5 times higher than those of Malaysia, the second biggest exporter (Chatham House, 2023; Statista, 2023). Research suggests that growing oil palm accounted for 33% of Indonesia's primary forest loss from 2001 to 2019 (Gaveau et al., 2022). This share was even higher in some regions. For instance, 50% of all deforestation on the island of Borneo between 2005 and 2015 can be associated with palm oil production (Voora et al., 2019).

However, there is a difference between the effects of industrial oil palm plantations and those of smallholders, as industrial plantations expanded by more than 6 million ha from 2001 to 2019, while smallholder plantations expanded by less than 2.3 million ha (Gaveau et al., 2022). Nevertheless, as palm oil provides superior yields over other crops—which may, in

²² A 2019 study found that palm oil plantations were the single largest deforestation driver in Indonesia, resulting in 23% of nationwide deforestation. The second largest single driver was identified as forest conversion to grassland/shrubland, contributing 20% to national deforestation. The expansion of small-scale agriculture and small-scale mixed plantations together resulted in 22% of national deforestation, while the expansion of timber and other large-scale plantations together resulted in 21% of national deforestation (Austin et al., 2019).



turn, support poverty reduction efforts and economic growth—Indonesia also uses palm oil as one of its main vehicles for development (Voora et al., 2019).

3.3.2 Overview of the Measure

Due to palm oil's strategic position in the Indonesian economy and the environmental impacts of oil palm plantations, the Indonesian government enacted measures to promote sustainable palm oil production and prevent deforestation. These measures include a forest moratorium, the mandatory Indonesian Sustainable Palm Oil certification scheme (both in 2011), and a palm oil moratorium in 2019.

Indonesia introduced the forest moratorium under Presidential Instruction No. 10/2011. The moratorium prohibits the conversion of primary natural forests and peatlands for palm oil, pulpwood, and logging concessions, excluding natural forests used for targeted timber harvesting and classified as secondary forests (Gaveau et al., 2022). It was extended in 2013 and became permanent in 2019 (Choiruzzad et al., 2021; Jong, 2019). The total avoided deforestation as a result of the moratorium from 2011 to 2018 resulted in a reduction of up to 86.9 million tonnes of carbon dioxide equivalent, and studies argue that there is room to strengthen the moratorium (Jong, 2022). For example, the moratorium map, which establishes the protected area, is revised every 6 months to reflect progress and identify barriers to implementation. Moreover, business licences granted within primary forests and peatlands before the moratorium entered into force in 2011 are still excluded (Kaoem Telapak & Environmental Investigation Agency, 2021).

The palm oil moratorium mandates the evaluation of palm oil permits and temporarily suspends the issuance of permits. An analysis conducted 3 years after this moratorium was enacted found that its implementation and results were unclear due to a lack of transparency and clear coordination among affected parties. Little information is available about how the palm oil moratorium is executed, including nationwide permit evaluation, though there are some positive signs, as local governments in some regions have revoked permits of companies that did not have the appropriate permits to operate (Kaoem Telapak & Environmental Investigation Agency, 2021).

The mandatory Indonesian Sustainable Palm Oil (ISPO) certification was introduced through the Ministry of Agriculture Regulation No.19/Permentan/OT.140/3/2011. This national certification system aims to foster more sustainable palm oil production and ensure the implementation of domestic laws and regulations concerning the sector. Furthermore, ISPO seeks to provide an alternative to international voluntary sustainability standards (such as the Roundtable for Responsible Palm Oil [RSPO]) that are less accessible to smallholders and small oil palm plantations while opening market opportunities for them with neighbouring countries, including China and India (Higgins & Richards, 2019). The regulation originally mandated that all palm oil plantation companies had to be ISPO certified no later than December 31, 2014. It was revised and superseded in 2015 by the Ministry of Agriculture Regulation No.11/Permentan/OT.140/3/2015, under which ISPO was significantly upgraded to include separate standards for palm oil plantations and factories, plantations, biodiesel factories, plasma plantations, and smallholder plantations. The government established the ISPO Commission, led by the Ministry of Agriculture, with members from different ministries



(i.e., Environment and Forestry, Economy, Manpower, National Land Agency) to design and oversee the implementation of the standard (Peteru et al., 2022).

The 2015 version of Ministry of Agriculture Regulation No.11 included a list of social and environmental criteria based on seven principles.²³ In essence, compliance with the ISPO certification scheme means that palm oil plantations respect the regulations and laws relevant to the sector, including the moratorium. This means, in theory, that new palm oil plantations are not allowed in primary natural forests and peatlands but are allowed in non-protected forests such

as secondary forests. However, some studies have found conflicts between the moratorium, national regulations, and criteria included in the standard.

Hidayat et al. (2018) found that “oil palm cultivation is explicitly permitted in peatlands under ISPO criteria 2.2.1.4”²⁴ in Principle 2 “plantation management,” raising concerns about its alignment with the moratorium and a Ministry of Environment and Forestry regulation concerning peatlands. However, under Principle 3 “protection of primary forests and peatlands,” growing oil palm in peatlands is forbidden in criteria 3.5, which requires the plantation manager to identify and protect HCV Areas (i.e., natural resources, man-made resources, and national and historic cultural values) and avoid clearance to grow oil palm, though it does not clearly specify identification procedures (Economics Climate Environment, 2015; McInnes, 2017). Nevertheless, the study also found that criterion 3.5 can contradict criteria 2.4 in Principle 2, which requires operators to cultivate their entire concession area even if it contains HCV Areas, as the standard and underlying regulations do not recognize HCV in converted areas (Hidayat et al., 2018). The inconsistency found within the standard itself and with related provisions in regulations raised concerns about the rigour of the scheme and may have also created confusion among palm oil companies (Hidayat et al., 2018).

Another concern about the design of the 2015 standard refers to the independence of the assurance mechanism. Palm oil operators must undergo a third-party assessment or audit of their practices to become certified. The audit is conducted by auditors who must pass a training course and be associated with certification bodies that are accredited directly by the ISPO Commission. The commission reviews and assesses the audit reports, and, in the case of a positive assessment, it allows the certification body to certify the operator. This means

²³ These are Principle 1: Legal plantation business permits; Principle 2: Plantation management; Principle 3: Protection of primary forest and peatland; Principle 4: Environmental management and monitoring; Principle 5: Responsibility to workers; Principle 6: Social responsibility and community economic empowerment; Principle 7: Continuous business improvement.

²⁴ “Plantation companies who cultivate palm oil in peat land should pay attention to the characteristic of the peatland to eliminate the environmental damage” (Hidayat et al., 2018).



the audits are not independent of the ISPO Commission—thus, the government (McInnes, 2017)—as it oversees the design of the criteria and the process of granting certifications. The certification is valid for 5 years, and auditors monitor compliance annually.

In light of these and other concerns with the standard, the government began a multistakeholder process in 2016 to strengthen the scheme by establishing the ISPO Strengthening Team, led by the Coordinating Ministry for Economic Affairs, which worked with local actors including business, academia, smallholders, and civil society. The aim of the process, which ended in 2020, was to improve the ISPO certification system and make Indonesian palm oil products more acceptable and competitive in the global market. Despite the government's intention to update the standard in a transparent and participatory manner, it eventually became largely a closed process with some proposals left out, such as adding two new principles to the standard related to traceability, transparency, and respect for human rights (Kaoem Telapak & Environmental Investigation Agency, 2021).

As a result, the government reviewed ISPO again in 2020, when Presidential Regulation No. 44 Year 2020 by the Ministry of Agriculture was passed, laying down the revised principles and mandating ISPO certification for both plantation companies and, for the first time, smallholders by 2025. Later in the year, the Ministry of Agriculture issued Regulation No. 38 Year 2020 on the Implementation of Sustainable Palm Oil Plantation. Various stakeholders objected, arguing that the regulation did not incorporate important inputs provided during the multistakeholder process (Environmental Investigation Agency, 2020).

The latest version of ISPO is an attempt to rectify the shortcomings of previous versions by improving the governance of palm oil plantations and smallholder farms on social, economic, and environmental issues and stepping up their sustainability performance so they can better adapt to changes in the international scene (Regulation of the President of the Republic of Indonesia No. 44 of 2020). It includes a standard for plantations and mills and a standard for independent smallholders.

The ISPO 2020 standard for plantations and mills unpacks its objectives across seven principles,²⁵ which are further elaborated in 30 criteria and 174 indicators and relate to underlying regulations from five different ministries (Peteru et al., 2022; Tropenbos Indonesia, 2020). The updated principles are

1. compliance with rules and regulations,
2. application of good plantation practices,
3. environmental management, natural resources, and biodiversity,
4. responsibilities for workers,
5. social responsibilities and community economic empowerment,
6. application of transparency, and
7. enhancement of business sustainability.

²⁵ The ISPO standard for smallholders covers Principles 1, 2, 3, 6, and 7 and includes 13 criteria and 33 indicators (Peteru et al., 2022).



The updated ISPO includes a new transparency principle that mainly refers to transparency in decision making when developing new principles and criteria regarding the participation of other actors. The new version also creates the ISPO Institute for Certification to issue certificates, scaling back the government's involvement. Furthermore, policy officials and representatives of business and academia, as well as independent monitoring agents, constitute the ISPO Commission and oversee the issuance of certification (Peteru et al., 2022). The new version of the standard also includes criteria that are expected to enable the source of fresh fruit bunches to be traced and made known to value chain actors by identifying the suppliers of the fresh fruit bunches and their buyers (Environmental Investigation Agency, 2020; ISPO, 2023; Peteru et al., 2022; Tropenbos Indonesia, 2020).

Regarding forest protection, the revised version explicitly refers to the need for palm oil operators to identify, manage, and monitor protected areas and HCV Areas located outside nature reserves and nature conservation areas and within the concessions, with plans to ensure their long-term sustainability. It promotes the use of HCV toolkits and other instruments recognized in national regulations (Environmental Investigation Agency, 2020; Peteru et al., 2022). Palm oil operators must obtain permits to clear forests to grow oil palm in the concession area. Plantations or mills that operate in an area bigger than 3,000 ha and 10 ha, respectively, must conduct environmental impact assessments before the start of operations. Those operating in smaller areas must prepare environmental management and monitoring documents. Smallholders and company growers may not use fire to clear land (Peteru et al., 2022).

Under the updated standard, clearance of primary forests is forbidden, and new plantings are not allowed in peatlands, although independent smallholders can establish new plantations in peatlands if they consider the characteristics of the area and technical requirements to avoid environmental degradation. Secondary forests are not protected in the latest version, which can be an important issue, as the government's definition of secondary forests can include what other actors consider primary forests (World Resources Institute, n.d.). Moreover, the scheme and related permits do not include criteria and indicators to assess the carbon stocks of a given area before planting, which could lead to the eventual clearance and loss of forest areas (i.e., secondary forests) with high carbon stocks (Environmental Investigation Agency, 2020; Peteru et al., 2022). Recent studies recommend stronger regulation of high carbon stock areas in the ISPO standard and underlying regulations (Environmental Investigation Agency, 2020; Peteru et al., 2022).

Reactions to the updated version of the standard have been tepid, as some stakeholders say it differs little from its predecessor, and they are eager to see how it plays out in practice and implementation (Environmental Investigation Agency, 2020; Tropenbos Indonesia, 2020).

3.3.3 Implementation and Monitoring Mechanisms

Two important bodies are in charge of ISPO governance. The ISPO Committee leads ISPO and designs the principles and criteria, assurance systems, and certification requirements, among others, while the ISPO Steering Council supervises it. The coordinating minister for economic affairs leads the steering council, which comprises ministers from different sectors (i.e., environment, forestry, land, trade, industry, and agriculture) and the head



of the National Standardization Body. The agriculture minister leads the ISPO Committee, which consists of representatives from the government, associations, the private sector, academics, and independent monitors, who are directly appointed by the Minister of Economic Affairs (Environmental Investigation Agency, 2022; Peteru et al., 2022).



To become certified for 5 years, producers have to follow a procedure that includes a ranking of local palm oil plantations and is overseen by the local government (Hidayat et al., 2018). Palm oil producers who want to apply for ISPO certification can submit their applications to a certification body. In other words, the ISPO certification scheme follows a third-party certification model. A certification body must be endorsed and accredited by the National Accreditation Committee to become an auditor. Fifteen accredited certification bodies now hold a licence to conduct the ISPO certification process (KEHATI, and SPOS, 2022; InfoSawit, 2021). Under the updated version of ISPO, these bodies must report on their assessments and certifications issued to the ISPO Committee, which oversees the certifications issued. Independent monitor agents who are members of this committee can submit complaints if they find irregularities or examples of non-compliant certified operators (Peteru et al., 2022).

If producers pass, the certification body will issue an ISPO certificate valid for 5 years. Annual surveillance audits are conducted over this period to assess compliance with the ISPO requirements. The Indonesian government provides financial support mechanisms to smallholders who want to become ISPO certified (voluntarily until 2025) (Suharto et al., 2015).

ISPO benefits from strong government support as a public-led initiative, ensuring commitment and policy implementation. Its broad coverage and mandatory nature offer the potential to facilitate comprehensive sustainability improvements. Further, the standard is specifically built on the local context of Indonesia, balancing sustainability goals with economic interests and national development needs. Its embedding into the national judicial system also offers the potential to impose stronger sanctions, such as revoking business permits, to discourage unsustainable practices (Hidayat et al., 2018; Suharto et al., 2015).

However, implementation and compliance with the ISPO standard face challenges in practice. Some companies—especially smallholders—have been slow to adopt and comply with ISPO because not all growers have land titles, which prevents them from obtaining the permits required to operate while complying with ISPO criteria, and because capacity building for farmers is expensive and takes time (Michida, 2023). While some improvements were made under the revised ISPO, these have been undermined by a lack of implementation (Environmental Investigation Agency, 2022).



Moreover, some gaps still need to be filled, such as an absence of technical provisions on how the new principles and criteria should be interpreted. This has led to different interpretations of compliance among auditors, which may lead to various certification outcomes. Also, little information is publicly available about the companies that are ISPO certified and how the ISPO system's governance structures are working (Environmental Investigation Agency, 2022).

3.3.4 Results

- 895 ISPO certificates covering 5.1 million ha have been issued (as of October 2022).
- Deforestation rates in primary forests have fallen since 2016, from 900,000 ha in 2016 to 200,000 ha in 2021.

As of October 2022, 895 ISPO certificates had been issued, affecting 5.1 million ha of oil palm productive land. This represents more than 30% of the total estimated productive land with oil palm plantations. It suggests that more efforts are needed to ensure that all oil palm plantations in the country comply with the scheme (Environmental Investigation Agency, 2022).

Given ISPO's nationwide mandate, it is worth looking at country-level deforestation data to measure its effectiveness. According to Global Forest Watch (n.d.), Indonesia lowered the rate of primary forest loss significantly in 2021 for the fifth straight year, with deforestation dropping from 900,000 ha of primary forest loss in 2016 to 200,000 ha in 2021—an annual rate of 26%. In the same period, total tree cover loss declined from 2.42 million ha in 2016 to 841,000 ha in 2021 (Global Forest Watch, n.d.). However, deforestation rates of both primary forests and tree cover rose slightly from 2021 to 2022 (World Resources Institute, n.d.). These data reveal that ISPO may have helped tackle deforestation thanks to the package of measures the government has put in place, though more still needs to be done.

A case study conducted among seven ISPO-compliant companies found that implementing the scheme managed “to change the company's environmental behavior to reduce forest conversion in concession areas and increase conservation areas as a fulfillment of ISPO principles and criteria” (Pasimura et al., 2022). The study found that the companies reduced forest conversion in concessions by 60% to 100% after having ISPO certification. It reveals that several factors supported this behavioural change, including the pressure of the regulation, the influence of the company's internal stakeholders, capacity building for plant managers and workers, and the potential to access credit as local banks increasingly consider compliance with ISPO in their credit assessments (Pasimura et al., 2022).

Despite research suggesting that ISPO has begun to bring about important changes, an assessment of available evidence suggests that it has not yet realized its full potential (Hidayat et al., 2018). In practice, this has led, for example, to ISPO-certified companies clearing forests outside their concession areas (Voora et al., 2019).

ISPO's limitations can be traced back to an unclear definition of problems, the limited power of the ISPO Commission, and concerns about the effectiveness of its decentralized system that implements and enforces the scheme. The lack of credibility of ISPO in the global



market has also diminished its potential. Regarding the definition of problems, ISPO's basic requirements were found to be rather vague, leading to different interpretations by different auditors (Hidayat et al., 2018), though this has improved with the updated 2020 version. In addition, as mentioned earlier, the independence of the third-party assessment of plantation operations and the process of granting certification has been questioned, though the latest version of the standard aims to tackle this by establishing the ISPO Institute for Certification to issue certificates and by allowing the participation of private sector actors, civil society, and independent monitoring agents in the ISPO Commission that oversees the issuance of certificates (Peteru et al., 2022).

While, in theory, ISPO's mandatory nature creates stronger sanctions and thus greater compliance incentives than voluntary schemes such as the RSPO, the effectiveness of sanctions has been questioned in the past. The main reason for this is the ISPO Commission's rather limited ability to enforce sanctions. Instead, the ISPO's enforcement capabilities are spread over different ministries and levels of government (i.e., regional governments) that face ongoing cooperation problems. A last key point is the limited credibility and trustworthiness of the ISPO among trading partners. This is a major barrier to global competitiveness, as it limits market opportunities for compliant operators. The reasons for this can be found in the limitations that have already been discussed, as well as the continued existence of an active black market for palm oil in Indonesia. The domestic black market is a serious challenge for the region's global reputation, because ISPO certification is not a prerequisite for local markets, which makes it difficult to trace the origin of palm oil that is exported (Hidayat et al., 2018). The updated version of ISPO tries to tackle this issue by requiring operators to conduct an assessment of supply chain certification (i.e., volume, sellers, buyers, certification data) by November 16, 2025 (Peteru et al., 2022).

Problems in the setup, implementation, and enforcement of ISPO have hindered its ability to achieve its objectives and overcome problems related to unsustainable palm oil production. The Indonesian government addressed some of ISPO's shortcomings in 2020 (President of the Republic of Indonesia, 2020), especially by extending the mandatory application of the scheme for all plantation business actors (including independent smallholders) to 2025 and by strengthening the ISPO Commission (for example, by reducing reliance on government bureaucracy in the certification process). However, the effects of recent policy changes remain to be seen, and, as another recent assessment of the ISPO suggests, further research is needed to better understand the specific dynamics of ISPO implementation (Abdul Majid et al., 2021).

Key Points

- There is slow adoption among smallholders, who require support in the form of training, information, monitoring, and financial resources.
- Updated versions of ISPO improve the criteria covered and assurance practices, though concerns still remain
- Unclear market benefits for ISPO-compliant palm oil



3.4 Peru: Land use formalization



3.4.1 Country Context

Peru has the third largest amount of tropical rainforest worldwide (68 million ha), with the Peruvian Amazon containing the second biggest share of the Amazon rainforest after Brazil (Tropical Forest Alliance, 2019). However, Peru's forests have been subject to increased deforestation and land degradation in recent decades, with data from the FAO indicating forest area had shrunk to a 56.5% share of total land in 2020 from 59.7% in 1990 (FAO, 2020c). This corresponds to an annual average deforestation rate of 120,000 ha, although in recent years, it has reached as high as 160,000 ha per year, making Peru's forests among the most deforested in the world (FAO, 2018). Peru has a high rate of primary forest; however, deforestation reduced its share to 86% of total forest area in 2020 from 88.5% in 2000 (Mongabay, 2022).

Deforestation pressures are linked to the expansion of small-scale agriculture, reflected in increased crop plantations for cocoa, coffee, palm oil, and coca (the base product for cocaine). Although many factors contribute to deforestation and land degradation in Peru, property allocation linked to land tenure rights has been a long-standing issue (De La Torre Ugarte et al., 2021). Insecure forest tenure can be highly problematic, as people who lack secure land rights are more likely to engage in unsustainable and short-sighted practices such as logging, farming, or mining to secure their livelihoods (Sunderlin et al., 2009). In Peru, insecure land tenure rights have been a major issue for resource-poor smallholders, who clear forests for agriculture as a way to acquire land and build their livelihoods. Engaging in agriculture on recently deforested land offers the benefit of reducing reliance on chemical inputs, making it an appealing choice for poor smallholders to secure their livelihoods. However, maintaining the converted land sustainably often proves difficult due to a lack of access to financial markets as well as technical experience, which, for example, can result in decreasing soil fertility, leading to a need for continuous expansion into new forest lands and ongoing patterns of cyclical migration and deforestation (World Agroforestry Centre, 2017).



3.4.2 Overview of the Measure

A key approach to reducing deforestation in Peru was the reform of land use rights since research suggests that unclear land tenure regimes caused 50% of deforestation in Peru in the period 2000–2014 (UN-REDD, 2018). Despite being integrated into global value chains, many smallholders and their activities remain largely informal and invisible to the state, making it impossible for them to participate formally in forest sector programs and thus receive any incentives to manage their land and forest resources sustainably. One reason is that legal property titles cannot be granted on state or otherwise

claimed forest land (World Agroforestry Centre, 2017). The lack of land tenure rights for smallholders reduces their commercial opportunities, hinders their access to financial resources, and increases the overall risk for unsustainable and long-term business operations, driving deforestation (Global Green Growth Institute [GGGI], 2020).

In this regard, the Peruvian government decided in 2011 (and again in 2015) to update its domestic Forestry and Wildlife Law (Law N° 29763) and to establish the National Program for the Recognition and Titling of Indigenous Communities' Territories (Programa Especial para la Titulación de Tierras - PETT).

The Forestry and Wildlife Law regulates forest management, forest plantations, agroforestry systems, wildlife, and Indigenous or rural communities. The law also establishes forest zones, namely:

1. **permanent production:** zones of primary and secondary forests and plantations that allow for the sustainable use of forests to extract timber and non-timber products and use of ecosystem services.
2. **protection and biological conservation:** zones of forests and ecosystems, including natural protected areas, that are preserved; their use is not allowed.
3. **restoration:** zones designed to preserve recovering forests and ecosystems to, at some point, allow their sustainable use to extract timber (zones of permanent production).
4. **special zones:** forest zones that require special treatment for their use (agroforestry, Indigenous land, private plots).

One of the most important pillars of the updated Forestry and Wildlife Law is the introduction of an innovative legal instrument: the Agroforestry Concession (AfC). This instrument provides concessions for the formal use of land and forests to eligible farmers who use public forest land in the Peruvian part of the Amazon. Each renewable contract can last for up to 40 years and can cover a maximum of 100 ha of land. Eligible smallholder farmers are those who had encroached on state forest land before 2011.



In exchange for receiving these rights under AfCs, farmers agree to commitments that include avoiding deforestation; preserving existing forests; using sustainable agroforestry practices; adopting measures to conserve soil and water; using the land for forest harvest, crop production, or ecotourism; and respecting forest zoning and ecological-economic zones²⁶ (GGGI, 2020). Farmers also must pay an annual fee for the use rights and forest extraction, present a plan for using and managing agroforestry systems, and register their plantations in the National Registry of Forest Plantations when applicable. While smallholders' production capacity depended on the continuous expansion of forest land or migration in the past, the option of AfCs presents a great incentive for farmers to settle down and focus on and invest in the sustainable use of just one parcel of land.

3.4.3 Implementation and Monitoring Mechanisms

The first step of implementation is presenting a concession request to the Regional Forestry and Wildlife Authority (Autoridad Regional Forestal y Fauna Silvestre (ARFFS)). There are certain minimum requirements to obtain the contract. ARFFS assesses the request against the eligibility criteria and decides if it is compliant. The minimum requirements are (1) geographic, related to the location within the eligible categories of forestry zoning (agroforestry and restoration zones), and (2) temporal, referring to the occupation and use of the area in a public and peaceful manner before the date of approval of the Forestry and Wildlife Law in 2011. There are also certain legal requirements related to the candidate—for example, the owner of the company cannot be facing current charges or have repeated convictions for environmental crimes (Robiglio & Mesia, 2018).

If the request is determined to be compliant, ARFFS uses the Geographic Information System (Sistema de Información Geográfica) to analyze the area that is the subject of the request and conducts an in-person evaluation. After the assessment, ARFFS produces a technical report and decides if the contract should be granted. If it is, the contract is signed, and the rights to the land are granted (Republica del Peru, 2017).

The Forestry and Wildlife Law specifies a series of direct and indirect incentives to promote the successful implementation of the AfC and the development of agroforestry systems at the national level. The government intends to encourage the development of activities to increase productivity and enhance the competitiveness of agroforestry systems through a compensation program. The incentives are mainly discounts on the annual utilization payments or fees when farmers adopt a series of best practices. These include conducting educational activities for local communities, restoring forests with two or more native species, or obtaining and maintaining voluntary forest certification. These incentives also aim to facilitate access to financial mechanisms and markets (Robiglio & Mesia, 2018).

²⁶ In addition to the forest zones, the Ministry of Environment has defined economic and ecological zones. These zones are delineated by purpose, including (a) permanent production (i.e., forestry, agriculture, mining); (b) protection and biological conservation; (c) restoration; d) special zones (i.e., for agroforestry; Indigenous land, cultural); and e) urban or industrial zones (Ministerio del Ambiente, Peru, 2019). Each municipality or region is invited to develop a map of its territory with the participation of local actors to delimit each zone based on physical, ecological, and socio-economic criteria. Each entity will produce specific regulations for the use and exploitation of each zone endorsed by the region or municipality.



Two VSSs operate in the forestry sector, but the FSC is the only one with a presence in Peru. In 2020, 1,087,349 ha of forests complied with the FSC standard, representing about 10% of total timber concessions granted in the country, most located in the Amazon region (FSC, 2020b; Kometter, 2019; World Wide Fund for Nature, 2023). The certified areas expanded from 771,000 ha in 2018 and are expected to continue growing thanks to the commitment of communities and forestry operators and support from the government and civil society organizations. The main markets for FSC-certified products include Germany, the United Kingdom, France, Spain, and the United States (FSC, 2020b).

The monitoring of compliance with the AfC commitments has been largely delegated to regional governments (Calus et al., 2019). Monitoring is largely done via field inspections and by using remote sensing and satellite imagery (Capella & Durand, 2022). The Peruvian government, for instance, established an “early warning system” for forest loss that reports on forest cover at least every 7 days and facilitates speedy interventions in illegal deforestation activities in the Peruvian Amazon (Amico, 2017). The sanctions for noncompliance can go from light, such as fines, to heavy, such as revoking the concession.

Implementation of the AfCs on state-owned forest land in the Peruvian Amazon is complemented by supporting research initiatives that provide evidence-based suggestions for the various socio-ecological contexts in Peru. This effort included a review of policy and technical documents to improve or clarify concepts and requirements, as well as fieldwork based on focus group discussions and household surveys to better understand local practices and the capacity of farmers to reduce dependence on forest conversion. This research also revealed the true potential of the AfCs. An estimated 120,000 smallholder families—primarily coffee and cocoa farmers—could benefit from this program, and “400,000 hectares of land out of the one million hectares they use could be preserved and the rest managed under an Agroforestry mosaic” (Claus et al., 2019; World Agroforestry Centre, 2017).

The main benefits of strengthening land tenure as an instrument to reduce deforestation lie in its community-based approach, its incentive for sustainable, far-sighted usage and conservation of forest land, and in the linked possibilities of legal recognition, such as access to basic socio-economic services. However, there are also limitations. Land tenure reforms often require sufficient political will in the first place, including decisions on the allocation of resources and the willingness to confront powerful interests benefiting from the status quo. Additionally, land tenure reforms may have limited impact if they do not address the root causes of deforestation, such as the adoption of agricultural practices that overexploit natural resources and rely on deforestation, land trafficking,²⁷ pressures to meet market demand for commodities, weak law enforcement and cross-institutional coordination, or a lack of alternative livelihoods. To unlock the effectiveness of land tenure reforms, these root causes must be addressed by supplementary measures and incentives that make sustainable agriculture economically attractive while disincentivizing further land conversion and supporting vulnerable smallholder farmers (FAO, 2022b; Larson et al., 2013; McLain et al., 2021; Sunderlin et al., 2009).

²⁷ “Land trafficking can be defined as the usurpation, illegal appropriation, and commerce of lands. It is closely linked with rural–rural and urban–rural migration and can be seen as an activity that organizes and facilitates migration” (Shanee & Shanee, 2016).



3.4.4 Results

- Peru's programs are still in early stages and under assessment.
- Strengthening land tenure has the potential to benefit 120,000 families and protect 1 million ha.
- Overall, Peru experience a slight decrease in forest cover: from 59.7% forest cover (1990) to 56.5% in 2020.

Although the implementation and rollout of the AfC instrument are ongoing, and there is no evidence regarding effectiveness, technical gaps have already been identified, and efforts have been made to close them. As implementation has become a priority for Peru, the AgroFor project was established²⁸ to help create the legal, institutional, technical, and financial conditions needed to implement the concessions on a large scale (AgroFor, 2021b).

A primary diagnosis of the AfC by the government in 2021 revealed “complex challenges that had to be faced by the agencies, both at political and field levels”²⁹ (Chiang & Reyes, 2021). AgroFor presented diagnostic reports on the implementation of concessions that identified four gaps: “1) during the technical process of granting and registration; 2) within the specifications of the maps and data sources to validate eligibility; 3) as part of data collection for the forest catalogue; and 4) in the exchange of registrations and information between agencies” (Chiang & Reyes, 2021). As a result, recommendations were made to improve the process of granting concessions and are being rolled out partially with pilots applying improved guidelines (Chiang & Reyes, 2021). These recommendations include, among others, incorporating new geographic features and validating methodologies and inputs to define AfC limits, as well as evaluation criteria (AgroFor, 2021a). Other studies have revealed weak enforcement of land governance tools such as forest zoning and economic and ecological zones, land trafficking, and weak cross-institutional coordination (World Agroforestry, 2022).

Another major finding was a lack of economic benefits from smallholders' perspective in formalizing land ownership. Smallholders have found both the registration process and the annual payment that comes with the titling complicated and costly and saw very few potential economic benefits, such as access to finance or markets (Claus et al., 2019). A pilot in the San Martin region highlighted the need to invest time and resources into explaining to farmers how they could best benefit from the concession and show the economic, technical, and agronomic advantages; expanding training and support services to farmers to implement good agricultural practices; establishing cooperatives; and teaching farmers about the potential of market tools, such as certification schemes to support their efforts (Gutierrez & Chiang, 2023).

A 2021 study by AgroFor suggests the potential of growing coffee and cocoa in compliance with VSSs in future agroforestry concessions in the San Martin region, as it can improve the

²⁸ A consortium of the GGGI, World Agroforestry Center, and the Peruvian Society for Environmental Law implements AgroFor, with support from the Norwegian International Climate and Forest Initiative.

²⁹ According to the report, the most important challenges can be found: “1) during the technical process of granting and registration; 2) within the specifications of the maps and data sources to validate eligibility; 3) as part of data collection ...; and 4) in the exchange of registrations and information between agencies” (Chiang & Reyes, 2021).



traceability of the product back to the farm and provide relevant information to value chain actors that can help guarantee the product is free of deforestation practices. The study reveals that greater demand for zero-deforestation coffee and cocoa could eventually open more market opportunities for producers and cooperatives in the region (Corporación ANALPES Perú S.A.C., 2021).

Several VSSs already operate in San Martín, including Fairtrade International, Organic, and Rainforest Alliance, and support cocoa and coffee growers in adopting more sustainable production practices.

The AgroFor study also found high-level alignment between the criteria of these schemes and the requirements to obtain and maintain an agroforestry concession, including undertaking practices that support forest and biodiversity conservation, soil health, water conservation, and waste management. All this suggests that VSSs can help producers in the region maintain the concession and preserve forests and other natural resources while opening market opportunities (Corporación ANALPES Perú S.A.C., 2021). Nevertheless, these VSSs are also improving their assurance approaches and traceability systems to better help farmers guarantee their crops are not associated with deforestation (Larrea et al., 2021). The study estimates that 30% of Peruvian cocoa and coffee exports are compliant with a VSS and that this can increase if demand in international markets grows (Corporación ANALPES Perú S.A.C., 2021).

In practice, the implementation of the AfCs is more complex than initially thought. Independent research finds that the AfCs have more of an effect on the living situation of informally settled families than on deforestation and that to address the latter, more complex approaches working at several policy levels are needed (Pokorny et al., 2021). However, as more evidence on the AfCs will soon be available, there are already success stories from another strand of Peruvian land tenure reforms: the entitlement of land rights to Indigenous People under the PETT. A 2017 study, for example, found indications that giving Indigenous communities in Peru title to land reduces forest clearing and disturbances soon after the title is awarded, mainly due to greater formal and informal regulatory pressure on and within the communities involved (Blackman et al., 2017). Despite important strides in strengthening land tenure for Indigenous People, more work must be done to ensure that Indigenous communities' land rights are fully recognized and protected.

Strengthening land tenure alone is not enough, however, and other policies to prevent deforestation need to be adopted simultaneously. For instance, the Peruvian government invests in education around sustainable land-use practices and restoration efforts around deforested areas, as well as through public-private partnerships (Tropical Forest Alliance, 2019).

Research also highlighted the need to establish a supplementary attractive incentive framework that would reduce farmers' dependence on continuous forest conversion. One of these



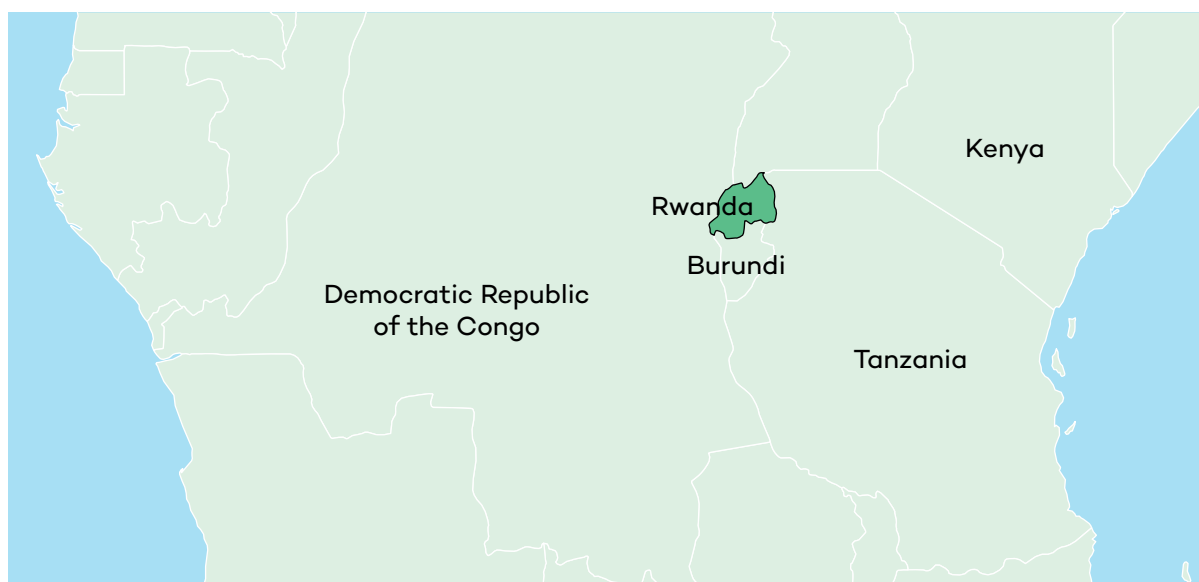


incentives is access to public financial programs in the field of agriculture and green financing (i.e., carbon finance, REED+) (GGGI, 2020), which can help diversify farmers' sources of livelihoods and reduce poverty.

Key Points

- Studies reveal slow adoption so far. Several issues must be tackled to accelerate adoption.
- The scope of the program should target areas that have a high risk of deforestation.
- Support to operators should include
 - capacity building for farmers on good agricultural practices, forest protection, and sustainable forest management;
 - information on the benefits of the concession to promote linkages with markets, technical assistance, access to finance, and cooperatives; and
 - financial incentives—concessions are not enough—and opportunities for green financing.
- Enhanced institutional capacity should include
 - stronger institutional coordination and enforcement of zones, including forest, ecological, and economic, and
 - better and easier access to administrative procedures (i.e., maps, data collection, registration).

3.5 Rwanda: Forest landscape restoration strategy



3.5.1 Country Context

Rwanda is home to the largest tropical mountain forests in Africa. Historically, forests have played an important role in Rwanda's economy and its people's livelihoods, including agriculture, the country's main economic sector (UNEP, 2023). However, Rwanda's forests



were subject to intense deforestation and forest degradation between 1990 and 2010. Whereas forests covered around 12.8% of total land (317,000 ha) in 1990, this share fell to 10.7% (265,000 ha) by 2010 (FAO, 2020d).

Increased deforestation in this period can be attributed to a combination of socio-political instability, population growth, and economic pressures. Starting with the Rwandan civil war in 1994, many people were displaced and forced to seek new land and sources of income, mainly in rural areas. In this context, agricultural expansion, logging, and charcoal production have been seen as easy ways to generate income. However, unsustainable land management damaged soil fertility and led to even more agricultural expansion (Moodley et al., 2010).

A lack of political attention facilitated deforestation, as other sectors of the country were given higher priority in the ongoing reconstruction work (FAO, 2010). With around 90% of the Rwandan population dependent on subsistence agriculture, high population growth has also had repercussions on the demand for natural resources (Republic of Rwanda et al., 2014; Uwiragiye & Maniragaba, 2020).

3.5.2 Overview of the Measure

Deforestation and forest degradation practices in Rwanda reached a critical “tipping point” in 2010. In 2009, the FAO estimated that as much as 40% of the cultivated land in Rwanda was at risk of severe erosion and required speedy investments (Republic of Rwanda, 2009). This urgency led to increased political will to act, and with the FLR approach that was gaining international momentum around this time, the Rwandan government found a potential way to address land degradation and its associated problems (Republic of Rwanda & IUCN, 2022).

Rwanda has had a National Forestry Policy since 2004, but due to the severity of the issues caused by widespread deforestation and forest degradation, the government decided to update it in 2010 (Republic of Rwanda, 2010). Part of the renewed forestry policy was an ambitious plan to sharply increase domestic forest cover and restore 2 million ha of deforested and degraded land by 2020 (Republic of Rwanda, n.d.).³⁰ This goal was in line with the country’s commitment under the Bonn Challenge (2011), a global effort to restore 150 million ha of the world’s deforested and degraded land by 2020 and 350 million ha by 2030. Notably, the country achieved its 2020 target in 2018. The updated 2010 version of the National Forestry Policy also incorporates measures to increase forest restoration and forest protection. These measures include promoting sustainable forest management and agroforestry systems; afforestation and reforestation initiatives; the private management of certain state forests through legal mechanisms; the establishment of buffer zone plantations around protected forests; and the implementation of integrated conservation and development programs with local communities neighbouring natural forests (Republic of Rwanda, 2010).

The forestry policy was updated in 2018. According to the revised policy, “forest resources will be managed to play an integral role in supporting Rwanda’s development goals” (Republic of Rwanda, 2018). The policy also defines seven policy statements that enshrine

³⁰ This modernized regulation was linked to the prior Strategic Plan for the Transformation of Agriculture in Rwanda, which was developed with assistance from the FAO (Republic of Rwanda, 2009).



the government's medium- to long-term targets for the development and management of national forest resources. These policy statements relate to institutional capacity, sustainable forest management, private sector participation, woody biomass energy, forest ecosystem conservation, participatory forest management, and agroforestry and trees outside forest development. The latest version of the policy also promotes raising awareness about and using PES, as well as engagement with the private sector and civil society.

In updating the forestry policy in 2010, the government started to establish a

policy framework based on strategies and practices linked to the FLR approach. FLR is a comprehensive, planned, and long-term process that seeks to regain ecosystem functionality and enhance human well-being across deforested or degraded landscapes. In terms of forests, the approach requires restorative measures to increase the number and health of trees on landscapes (McBreen & Jewell, 2023; Rietbergen-McCracken et al., 2008). According to the IUCN, the FLR approach encompasses six principles that guide the implementation of projects: (1) manage adaptively for long-term resilience; (2) tailor to the local context using a variety of approaches; (3) focus on landscapes; (4) restore multiple functions for multiple benefits; (5) maintain and enhance natural ecosystems within landscapes; and (6) engage stakeholders and support participatory governance (McBreen & Jewell, 2023).

This approach offered Rwanda a chance to reach broader, overarching goals, such as boosting agricultural productivity, improving food security and rural incomes, increasing resilience to climate change, improving water supply, and reducing vulnerability to landslides and other disasters (Republic of Rwanda & IUCN, 2022).

To achieve the goals of its FLR approach, and in collaboration with the World Resources Institute and the IUCN, Rwanda elaborated a detailed Forest Landscape Restoration Opportunities Assessment (FLROA) in 2014. This assessment involved a comprehensive analysis of the country's ecological, social, and economic conditions and identified strategies for implementation (Republic of Rwanda et al., 2014).

One of the main strategies suggested by the FLROA was promoting sustainable agroforestry and land-use practices. This involves integrating trees and crops on farmlands to increase soil fertility, reduce erosion, and provide alternative income streams for farmers. According to one study, timber trees, Eucalyptus, and Alnus were the most common species among species integrated within farms, with 36% to 40% of farms growing them on their land. These trees provide multiple benefits, such as timber, fuelwood, charcoal, and stakes for income and household use (Mukuralinda et al., 2016).



The FLROA recommended the implementation of reforestation and afforestation programs³¹ that involved planting trees on degraded lands to restore ecosystem services. To put this into practice, the Rwandan government introduced annual forest planting seasons (Republic of Rwanda et al., 2014; Republic of Rwanda & IUCN, 2022). For example, 25 million trees were planted during the 2020/2021 forest planting season, which encompassed 7,400 ha of agroforestry, 900 ha of classic forest, and 77,000 fruit trees (Republic of Rwanda, n.d.). The Rwanda Environment Management Authority and the Rwanda Forestry Authority also launched tree seed centres to increase the availability of high-quality seeds.

In addition, the FLROA recommended creating demonstration sites and offering training to encourage farmers to adopt sustainable practices as well as developing institutional frameworks for communal forest management (Republic of Rwanda et al., 2014). In this line, the government established learning centres that offered a series of courses to train and inform the public about forest management and agroforestry. In addition, these topics have been included in school curricula to ensure that citizens are engaged and informed from a young age. Moreover, public information campaigns were launched to communicate the environmental, social, and financial benefits of nature restoration.³²

3.5.3 Implementation and Monitoring Mechanisms

FLR projects are voluntary and conducted in partnership with the private sector and civil society. They are funded through public and private sources, as well as international cooperation. A range of stakeholders, including the government, non-governmental organizations, local communities, the private sector, and development partners, implement the FLR approach in Rwanda. Several VSSs are operating in Rwanda in the coffee and tea sectors, including Organic, Fairtrade International, and Rainforest Alliance, supporting growing practices that can help restore and preserve forests. As an illustrative example, a tea plantation juxtaposed with the national park of Nyungwe is certified under Rainforest Alliance, implementing practices that help preserve the habitats and ecosystems (Chowdhury et al., 2021; Nyungwe Forest National Park, 2023).

The Ministry of Environment oversees and coordinates FLR efforts across different ministries and agencies. It develops policies, strategies, and plans related to forest conservation and restoration. Non-governmental organizations, both national and international, work closely with the government and local communities and smallholders, providing technical expertise, funding, and project implementation support. Local communities actively participate in FLR implementation, engaging in decision-making processes and carrying out restoration activities. They manage community forests and promote sustainable land-use practices. The private sector, including businesses in forestry, agriculture, and ecotourism, can also contribute to FLR by adopting sustainable practices and investing in restoration activities. Public-private partnerships are also encouraged to mobilize resources for FLR projects. Development

³¹ The former restores trees where the number has decreased; the latter plants trees or sows seeds in areas that did not have trees before.

³² For two examples of public information campaigns, see the Rwanda Wildlife site, <https://www.rwandawildlife.org/youth-environmental-education-programme/>, and the Rapid Transition Alliance site, <https://rapidtransition.org/stories/the-rapid-revival-of-rwandas-thousand-hills-how-people-and-policy-brought-nature-back/>.



partners, such as bilateral and multilateral agencies, provide technical and financial support, aligning FLR efforts with international commitments (Republic of Rwanda & IUCN, 2022).

The National Forest Landscape Restoration Cross-Sectoral Task Force was established in 2016 to share experiences and discuss ways to implement FLR projects effectively. It serves as an umbrella platform for two other groups: (1) the Agroforestry Task Force, formed in 2021 to coordinate and harmonize agroforestry initiatives, monitor, and evaluate the impacts of agroforestry implementation, develop technical guidelines, and advocate for resources and partnerships, and (2) the Erosion Control Task Force, created in 2022 to coordinate all erosion-control interventions in Rwanda (Karch et al., 2023).

The FLR's complex and context-sensitive strategy requires continuous monitoring, technical assistance, and adaptive management (UN-REDD, 2023). The FLR mechanism in Rwanda is monitored for compliance through various approaches and mechanisms, including a National Forest Monitoring System. Rwanda developed this system to monitor forest resources, including those under FLR projects. The system uses remote sensing, satellite imagery, and ground-based data collection to assess changes in forest cover, biodiversity, and ecosystem services. It provides reliable information for monitoring compliance with FLR objectives and targets (Republic of Rwanda, 2017; Republic of Rwanda & IUCN, 2022).

The strengths of FLR lie in its potential to provide substantial environmental benefits coupled with socio-economic benefits, as well as in its flexible approach (Stanturf et al., 2019). On the environmental side, FLR seeks not only to restore landscapes, but also to improve soil health and reduce erosion, increase water availability, mitigate the impacts of climate change, and restore natural ecosystems. On the social side, FLR involves collaborating closely with local communities to restore forests and promote sustainable land-use practices. This participatory approach leads to economic benefits—such as more opportunities for agroforestry and ecotourism—as well as customized tailoring to local conditions to help meet the needs and priorities of local communities more effectively than other approaches (Lamb et al., 2012).

However, FLR also has several weaknesses or limitations, most of which relate to its broad, costly, and long-term oriented framework. There is no “one-size-fits-all” FLR solution: each country has a unique context that requires the creation of a unique FLR strategy (Stanturf et al., 2019). FLR also demands continuous monitoring, technical assistance, and adaptive management of the strategy (UN-REDD, 2023). This is not only costly, but from a practical perspective, it makes results and lessons hard to compare across countries. The broad nature of FLR also provides for various pillars vital for FLR's success that could, if inadequate or not implemented correctly, prevent success in practice (Höhl et al., 2020).





3.5.4 Results

- 80 restoration projects have been implemented.
- Studies reveal improved soil fertility.
- FLR programs have increased yields by three times for soybeans and maize, four times for beans, and 10 times for Irish potatoes.
- Overall Rwanda experienced a change in forest cover: 30.4% in 2022, up from 10.7% in 2010.

While it is still rather early to assess concrete results from Rwanda's FLR due to its long-term orientation, early indications are encouraging. Eighty restoration projects, some spanning multiple districts, have been implemented nationwide since 2011. The districts with the most projects are Bugesera and Gatsibo (Republic of Rwanda & IUCN, 2022). On a broader scale, data from 2020 reveal that the tide may indeed be turning, as forest coverage in Rwanda has increased from 10.7% (265,000 ha) in 2010 to 30.4% (724,662 ha) in 2022 (of which 53% are plantations, 21% wooded savannas, 19% natural mountain rainforests, and 6.2% shrubs) (FAO, 2020d; Republic of Rwanda, n.d.). Other studies reveal that by improving soil fertility, yield increases of up to three times for soybeans and maize, four times for beans, and 10 times for Irish potatoes have been recorded (World Bank & International Center for Tropical Agriculture, 2015).

These results suggest that Rwanda's restoration policy model was able to stop deforestation and even reverse net deforestation. Thus, the country has been internationally lauded as a "restoration leader" (IUCN, 2020b). In turn, Rwanda's active positioning has attracted donor support and private investment. The country has also increased domestic financing significantly (Republic of Rwanda & IUCN, 2022).

There is still potential to improve, however, as other research has shown that while Rwandan farmers are the main implementers of FLR policies, they lack sufficient access to the resources they need to achieve FLR objectives to the fullest extent, including diverse, reliable, and resilient networks of finance, seedlings, and information needed for successful restoration interventions. This is likely caused by diverging priorities at different levels of government that lead to a misallocation of resources on a broader level among the many stakeholders involved (Buckingham et al., 2021). Other research has shown that Rwanda's initial FLROA may have underestimated issues concerning land tenure, as they were not considered in a substantive manner (McLain et al., 2021).

The FLR approach has helped reverse deforestation and restore forests and ecosystems in Rwanda as part of a broader strategy the government adopted in 2011. As a long-term approach, it has required the coordination of multiple ministries, agencies, and communities and the engagement of civil society and the private sector. The approach has enabled the implementation of measures that have helped raise awareness among farmers and communities of the value of forest restoration while facilitating the training of farmers and citizens with practical tools and demonstration sites and the provision of seedlings. The



involvement of international cooperation agencies and the private sector has also helped to raise funds to finance restoration projects.

As the UN Decade on Ecosystem Restoration has just started, there is more potential on the regional and international levels to boost implementation, scale up finance, and coordinate FLR efforts for greater impact—not just in Rwanda but worldwide (Mansourian et al., 2021; UNEP & FAO, 2021).

Key Points

- FLR is a long-term approach.
- Enabling conditions include implementation across ministries, agencies, and communities.
- Success requires awareness raising and capacity building, financial resources, and a network of participating actors, including civil society, the private sector, and international cooperation agencies.
- FLR should include a strong and comprehensive policy framework that links with other environmental policies.
- Special attention should be paid to a strategy for smallholders that includes training, demonstration sites, and the provision of seedlings.



4.0 Key Takeaways for the Design and Implementation of Measures to Enhance Forest Conservation and Reduce Deforestation

We have identified seven different lessons learned from our analysis of the case studies of Costa Rica, Peru, Rwanda, Indonesia, and Gabon. Governments can leverage the lessons learned from these experiences when developing and/or implementing measures designed to enhance forest conservation and reduce deforestation.

Box 4. Seven lessons learned

1. Reducing deforestation and improving forest conservation require a combination of measures that respond to the country context and address the causes of deforestation.
2. Measures to enhance forest conservation and address deforestation need to target areas that are at high risk of deforestation.
3. Recognizing the economic and environmental value of forests is critical for reversing deforestation, restoring land, and preserving forests as part of a long-term government commitment and strategy.
4. An enabling environment is required to support producers, forestry operators, and smallholders in complying with policy measures that prevent deforestation and enhance forest conservation.
5. Engaging with multiple actors and mobilizing funds from both the public and private sectors to support efforts to reduce deforestation and enhance forest conservation are important methods to achieve results across various scales.
6. VSSs can complement and support the implementation of measures to enhance forest conservation and reduce deforestation.
7. A combination of both physical and digital monitoring can help ensure the proper implementation of the measures while allowing for real-time monitoring and obtaining meaningful information on forests and biodiversity inventories.

4.1 Reducing Deforestation and Improving Forest Conservation Require a Combination of Measures Tailored to the Country Context That Address the Causes of Deforestation

A system of measures is needed to address deforestation. All five countries that were analyzed have multiple complementary measures in place. As seen, measures that aim to address



environmental issues can be categorized as enabling, incentives, or disincentives. For example, Costa Rica not only has the PES, which constitutes an incentive, but disincentives are also in place, such as the prohibition of land-cover change in established forests with sanctions of up to 3 years of prison under the Forestry Law 7575. In Gabon, the policy requiring mandatory compliance with private certification for logging licences is complemented by different value-addition policies, such as the 2010 export ban on raw logs and the requirement that 100% of the timber is to be processed in the country. Gabon has also had a Forest Code in place since 2001 that requires logging companies to adopt sustainable forest management practices. In the case of Indonesia, ISPO certification is complemented by the forest moratorium, which prohibits the conversion of primary natural forests and peatlands for palm oil, and the palm oil moratorium, which mandates the evaluation of palm oil permits and temporarily suspends the issuance of permits.

An interesting enabling measure is forest zoning. The Forestry and Wildlife Law of Peru creates forest zones, categorizing land and specifying the type of activities permitted according to each category. This, in turn, is used as an eligibility requirement when granting the AfC, as the land must be located in eligible categories of forest zoning, namely, special zones for agroforestry and restoration zones.

Another key insight from these case studies is the importance of context-specific measures. The case studies underscore the need to tailor measures to address the particularities of each context. This contextual approach considers a range of factors, including earlier measures in place, available resources, and specific objectives. Not all measures are needed in all contexts; this is why it is important to identify the main causes of deforestation and then address them. Costa Rica built the PES program on the legacy of previous programs that also introduced financial incentives to protect forests. Insecure land tenure rights have been a major reason behind deforestation in Peru, as resource-poor smallholders have historically cleared forests for agriculture as a way to acquire land and build their livelihoods. This is why Peru introduced a measure targeting land use formalization, which translated into agroforestry concessions. The case of Indonesia is different: palm oil production is the main driver of deforestation, which prompted the enactment of measures to promote sustainable palm oil production and prevent deforestation, such as the introduction of a mandatory national certification scheme.

4.2 Measures to Enhance Forest Conservation and Address Deforestation Need to Target Areas That Are at High Risk of Deforestation.

Costa Rica's case study illustrates the importance of targeting high-risk deforestation areas to increase effectiveness. The allocation of resources to areas that are not at risk of deforestation prevents countries from effectively reducing their deforestation rates. Several studies have been conducted on Costa Rica's PES effectiveness that highlight how the impact of the program increases when high-risk deforestation areas are targeted.

Moreover, depending on the measure, eligibility criteria can also be key, as shown by the cases of Peru and Costa Rica. By introducing eligibility criteria, it is possible to target the areas



that should be prioritized, such as those that are at high risk of deforestation, or, alternatively, HCV or high carbon stock areas.

The definition of forests is also critical. Notably, the analyzed case studies each envisage a different definition of “forest.” The definition of forests has multiple consequences, not only in terms of the measure’s scope but also in terms of implementation and monitoring, as well as deforestation rate estimations.

Table 3. Forest definitions by country

Costa Rica	A native or indigenous ecosystem, intervened in or not, regenerated by natural succession or other forestry techniques, that covers a surface of 2 or more ha, characterized by the presence of mature trees of different ages, species, and appearance, with one or more canopies covering more than 70% of the area and with more than 60 trees per hectare with a diameter at breast height of more than 15 cm. ³³
Peru	Predominantly arboreal ecosystem that must have an area greater than 0.5 ha, with a minimum width of 20 metres, and present a minimum crown coverage of 10%. The predominant vegetation is represented by trees of woody consistency that have a minimum height of 2 metres in their adult state for the coast and mountains and 5 metres for the Amazon rainforest. ³⁴
Rwanda	Forests are defined as patches of 0.5 ha with a tree canopy cover of 10% or more. Tree canopies between 10% and 20% are labelled “sparse” (Ministry of Environment, 2019).
Indonesia	A land area of more than 0.25 ha with trees higher than 5 metres at maturity and a canopy cover of more than 30%, or trees able to reach these thresholds in situ (Minister of Forestry Regulation Number: P.14/ Menhut-II/2004, p. 1, Art. 1).
Gabon	All perimeters with plant cover capable of providing wood or non-agricultural plant products, sheltering wildlife, and having a direct or indirect effect on the soil, climate, or water regime. ³⁵

³³ Authors’ translation of Art. 3 of Forest Law 7575 (1996): “Bosque: Ecosistema nativo o autóctono, intervenido o no, regenerado por sucesión natural u otras técnicas forestales, que ocupa una superficie de dos o más hectáreas, caracterizada por la presencia de árboles maduros de diferentes edades, especies y porte variado, con uno o más doseles que cubran más del setenta por ciento (70%) de esa superficie y donde existan más de sesenta árboles por hectárea de quince o más centímetros de diámetro medido a la altura del pecho (DAP).”

³⁴ Authors’ translation of Methodological Framework of the National Forestry and Wildlife Inventory through Executive Directorate Resolution n.º 253-2016-SERFOR-DE (2016): “ecosistema predominantemente arbóreo que debe tener una superficie mayor que 0,5 ha, con un ancho mínimo de 20 metros y presentar una cobertura de copas mínima del 10 %. La vegetación predominante está representada por árboles de consistencia leñosa que tienen una altura mínima de 2 metros en su estado adulto para costa y sierra, y 5 metros para la Selva amazónica.”

³⁵ Authors’ translation of Art. 4, Law 016-01 on the Forest Code in the Gabonese Republic: “forêts, l’ensemble des périmètres comportant une couverture végétale capable de fournir du bois ou des produits végétaux autres qu’agricoles, d’abriter la faune sauvage et d’exercer un effet direct ou indirect sur le sol, le climat ou le régime des eaux.”



4.3 Recognizing the Economic and Environmental Value of Forests Is Critical for Reversing Deforestation, Restoring Land, and Preserving Forests as Part of a Long-Term Government Commitment and Strategy.

It is important in the development of policy measures to recognize the economic and environmental value of forests in the long term. For instance, Costa Rica managed to reverse deforestation following structural changes in the economy and a political commitment to engage in prioritizing forest conservation and the sustainable management of forests. Forests were given an economic value through ecotourism, which increased local economic gains and protected biodiversity while minimizing environmental effects from tourism.

In Rwanda, the landscape restoration strategy is used to increase the economic and environmental value of forests, building an economy with a strong component of forest conservation. By integrating trees and crops, soil fertility is increased, soil erosion is reduced, and farmers have access to an alternative line of income. Moreover, Rwanda's strategy is cross-cutting, with several ministries and government agencies supporting its implementation.

Research in Peru also highlighted the importance of an economic incentive—sustainable agriculture must become economically attractive to discourage land conversion. Access to public financial programs in the field of agriculture and green financing can constitute an incentive for farmers to protect forests and diversify their livelihoods.

Efforts to address deforestation can, in turn, lead to international financing. For example, Costa Rica became the first country to receive a payment from the World Bank's multi-donor Forest Carbon Partnership Facility. The country received USD 16.4 million for reducing 3.29 million tonnes of carbon from 2018 to 2019, and two additional payments are expected by 2025. Additionally, in 2021, Gabon became the first country in Africa to receive USD 17 million from the Central Africa Forest Initiative for lowering emissions and maintaining a low deforestation rate.

4.4 An Enabling Environment Is Required to Support Producers, Forestry Operators, and Smallholders in Complying With Policy Measures That Prevent Deforestation and Enhance Forest Conservation.

An enabling environment is needed to comply with measures that aim to address deforestation. The cases underscore the need for secure land titles. For instance, a study in Costa Rica revealed that poorer smallholders have less access to the PES program, with land titles among the barriers that prevent them from enrolling in it. In Peru, the issue of land titles was central to deforestation, which led to the development of a specific policy reforming land tenure rights and introducing agroforestry concessions. In Indonesia, the lack of land title also prevents farmers from obtaining the required permits to operate in compliance with ISPO criteria.



A long-term approach is also important when implementing policy measures to address deforestation. Time is a key factor when implementing measures that aim to promote forest conservation and address deforestation, not only in terms of reaping tangible results and the desired outcomes but also in terms of applying such measures.

In Peru, studies revealed that implementation is more complex than initially thought. It requires time to raise awareness of the measure and to engage with smallholder farmers, who may find the process complicated and costly. In this sense, a pilot noted the importance of investing time and resources to provide capacity building to farmers, explaining the advantages of the measures and setting up mechanisms to help farmers use the concessions to implement good agricultural practices.

Slow adoption is also observed in Indonesia and Gabon, as adhering to certification requires fundamental changes and takes a considerable amount of time and money. Adoption can be accelerated by providing support in the form of training, information, and financial resources. In this regard, Indonesia offers funding for ISPO certification submitted by smallholders. The regulation introducing ISPO certification specifies in Article 18 that the funding can be sourced from the state budget, the regional budget, and/or other legal sources (President of the Republic of Indonesia, 2020).

In sum, an enabling environment must be in place, along with a transition period or action plan that supports the shift to more sustainable practices and transparency mechanisms that seek to promote forest conservation. A transition period for implementation provides for a specific time frame for stakeholders to adjust their practices, operations, and processes gradually. Moreover, capacity building is key to facilitating implementation.

4.5 Engaging With Multiple Actors and Mobilizing Funds From Both the Public and Private Sectors to Support Efforts to Reduce Deforestation and Enhance Forest Conservation Are Important Methods to Achieve Results Across Various Scales.

To address deforestation effectively, multiple actors—and smallholders, in particular—must be involved. It is also essential to mobilize funds from both the public and the private sectors.

Rwanda stands out as an example of public and private sector participation. In fact, the 2018 National Forest Policy explicitly states in Policy Statement 3 that the “private sector will be encouraged and supported to increase their investment in [the] forestry sector,” recognizing the importance of exploring and encouraging all sources and mechanisms of funding to achieve effective, sustainable forest management. In terms of vital actions during implementation, the policy mentions a need to publish information on investment opportunities to the private sector and to develop effective public–private partnerships in the forestry sector, among others (Republic of Rwanda, 2018). Notably, communities are recognized as key actors during the implementation of the policy. There is a special focus on smallholders, raising awareness of the value of forest restoration, delivering training, setting up demonstration sites, and providing seedlings.



Indonesia attempted to strengthen the ISPO standard in 2016 by starting a multistakeholder process that coordinated multiple actors, including business, academia, smallholders, and civil society. Despite the intention to update the standard through a participatory process, the last revision of ISPO is the result of a process that left out some of the proposals put forward by stakeholders. Therefore, the updated version of the standard has been received with caution, which highlights how important it is to engage with all involved actors for efficiency.

The partnership between Gabon and the FSC illustrates the advantages of public–private partnerships. For example, five priorities are laid down in the cooperation agreement signed by both parties; notably, these include increasing the participation of key actors, including civil society, and providing capacity building for sustainable forest management. Activities include strengthening local capacity for field implementation through training and information sessions, among others.

In terms of diversity in funding, Costa Rica relied not only on government funding when setting up the PES mechanism but also mobilized and established agreements with private sector funds, mainly hydroelectric plants. Moreover, when initiating the program, Costa Rica turned to international funds, such as loans from the World Bank, and bilateral agencies, including the German Development Bank and the Global Environmental Facility. As already mentioned, as a result of Costa Rica’s efforts to address deforestation, the country also received funds from the World Bank’s multi-donor Forest Carbon Partnership Facility. In Rwanda, the involvement of international cooperation agencies and the private sector raised funds to finance the restoration projects.

4.6 VSSs Can Complement and Support the Implementation of Measures to Enhance Forest Conservation and Reduce Deforestation.

VSSs can help governments implement measures to enhance forest conservation and reduce deforestation. The examples in this report illustrate that governments can intentionally collaborate with VSS systems to support farmers in adopting sustainable practices that protect forests and prevent deforestation. In the example of Gabon with the FSC, the national framework of sustainable forest management was revised based on the principles and criteria of this standard. At the same time, the FSC provided capacity building to producers for adopting sustainable forest management practices.

Governments can also explicitly reference compliance with these schemes in their policies and regulations as an incentive for producers to adopt more sustainable growing practices and potentially obtain a direct monetary benefit; for instance, a reduction of the annual fee for benefiting from the agroforestry concession, as in the case of Peru. In exchange, VSSs can help producers implement good agricultural practices, adding value to their produce and gaining market access when there is demand for VSS-compliant products.

Governments can also benefit from collaborating with VSS systems operating in their jurisdictions to expand capacity-building efforts to producers or reinforce monitoring initiatives to ensure that growing practices do not lead to deforestation, forests are protected,



and producers benefit from ecosystem services (as in Costa Rica). VSSs can also help trace the products through the value chain back to the origin farm or plantation and help provide product sustainability information, especially concerning forest protection (as in Gabon).

In all cases, it is important that governments and VSS-setting bodies set up measures that help producers comply with the requirements and cover the associated costs of certification. These measures include extension services that help producers understand the standards' requirements and support them in transitioning to compliant practices, promoting market demand for VSS-compliant products and direct links with buyers, and establishing producer organizations (Elder, 2023). Governments could also share or subsidize part of certification costs, especially in the first years of compliance.

4.7 A Combination of Both Physical and Digital Monitoring Can Help Ensure the Proper Implementation of the Measures While Allowing for Real-Time Monitoring and Obtaining Meaningful Information on Forests and Biodiversity Inventories.

In most of the case studies, a combination of physical and digital monitoring is in place to ensure that the measure is implemented properly.

Costa Rica's assessment of compliance combines activities such as FONAFIFO staff visits to the farms with PES contracts and reports by forest regents who monitor forest management plans. In addition, an advanced digital monitoring system, the GIS, maps forests and monitors canopy cover every 5 years. Notably, in 2015, Costa Rica developed the world's first system to overlay satellite images with land registry records and does so annually for the entire national territory. The system detects forest loss and gains from agro-commodity production and produces inventories of the types of species and the volumes or numbers of species/trees.

Peru combines field inspections with remote sensing and satellite imagery. The country also has an "early warning system" in place for forest loss. The system reports on forest cover at least every 7 days and allows for speedy interventions in the case of illegal deforesting activities in the Peruvian Amazon. Rwanda also relies on remote sensing, satellite imagery, and ground-based data collection to assess changes in forest cover but also in biodiversity and ecosystem services.

Gabon monitors compliance with the FSC through annual audits based on field visits and documents. The FSC recently set up a satellite and geographic information monitoring system to facilitate auditors' efforts to monitor compliance with the principles and criteria while obtaining real-time data. The Gabonese government has also established a satellite research station to collect images to keep track of land-use changes and to detect and tackle deforestation activities.

Addressing deforestation requires a long-term strategy that includes many complementary measures. When designing such measures, there is value in learning from the experience of governments that have been implementing or developing different measures or approaches.



The experiences of the selected countries can provide useful starting points for governments in the Global South seeking to preserve their forests and comply with emerging regulations and international frameworks that target deforestation-free commodity production, as well as forest conservation and restoration more broadly.



References

- Abdul Majid, N., Ramli, Z., Md Sum, S., & Awang, A. H. (2021). Sustainable palm oil certification scheme frameworks and impacts: A systematic literature review. *Sustainability*, 13(6), Article 3263. <https://doi.org/10.3390/su13063263>
- AgroFor. (2021a). *Reduction of gaps in the granting and registration of agroforestry concessions*.
- AgroFor. (2021b). *Our proposal*. <https://www.agrofor.info/en/about-us/our-proposal/>
- Amending Finance Law 2020 (No. 75 Ter Special) (2020, July 20) (Loi de finances rectificatives 2020 [No. 75 Ter Special]). *Journal Officiel de la Republique Gabonaise*. <https://www.droit-afrique.com/uploads/Gabon-LF-2020-rectificative.pdf>
- Amico, D. (2017, October 27). *The paths to reducing deforestation in the Peruvian Amazon*. World Wildlife Fund for Nature–Peru. https://wwf.panda.org/wwf_news/?312611/paths%2Dto%2Dreducing%2Ddeforestation%2Din%2Dthe%2DPeruvian%2DAmazon
- Anderegg, W. R. L., Trugman, A. T., Bowling, D. R., Salvucci, G., & Tuttle, S. E. (2019). Plant functional traits and climate influence drought intensification and land–atmosphere feedbacks. *Proceedings of the National Academy of Sciences*, 116(28), 14071–14076. <https://doi.org/10.1073/pnas.1904747116>
- Arriagada, R. A., Ferraro, P. J., Sills, E. O., Pattanayak, S. K., & Cordero-Sancho, S. (2012). Do payments for environmental services affect forest cover? A farm-level evaluation from Costa Rica. *Land Economics*, 88(2), 382–399. <https://doi.org/10.3368/le.88.2.382>
- Austin, K. G., Schwantes, A., Gu, Y., & Kasibhatla, P. S. (2019). What causes deforestation in Indonesia? *Environmental Research Letters*, 14(2), Article 024007. <https://doi.org/10.1088/1748-9326/aaf6db>
- Bermudez, S., Voora, V., Larrea, C., & Luna, E. (2022). *Global market report: Cocoa prices and sustainability* (Sustainable Commodities Marketplace Series). State of Sustainability Initiatives, International Institute for Sustainable Development. <https://www.iisd.org/system/files/2022-11/2022-global-market-report-cocoa.pdf>
- Biodiversity Law 7788 of 1998 (Ley de Biodiversidad 7788) [Costa Rica]. http://www.pgrweb.go.cr/scij/Busqueda/Normativa/Normas/nrm_texto_completo.aspx?param2=NRTC&nValor1=1&nValor2=39796&strTipM=TC
- Blackman, A., Corral, L., Lima, E. S., & Asner, G. P. (2017). Titling indigenous communities protects forests in the Peruvian Amazon. *Proceedings of the National Academy of Sciences*, 114(16), 4123–4128. <https://doi.org/10.1073/pnas.1603290114>
- Börner, J., & Vosti, S. A. (2013). Managing tropical forest ecosystem services: An overview of options. In R. Muradian & L. Rival (Eds.), *Governing the provision of ecosystem services* (Studies in Ecological Economics, Vol. 4, pp. 21–46). Springer, Dordrecht. https://doi.org/10.1007/978-94-007-5176-7_2
- Brainforest. (2020, January 21). *TRACER-Nkok est une agence qui met en place le service TRACER*. <https://www.brainforest-gabon.org/actualites/?id=241>



- Buckingham, K., Arakwiye, B., Ray, S., Maneerattana, O., & Anderson, W. (2021). Cultivating networks and mapping social landscapes: How to understand restoration governance in Rwanda. *Land Use Policy*, 104, 104546. <https://doi.org/10.1016/j.landusepol.2020.104546>
- Capella, J. L., & Durand, L. (2022). *AgroFor: Peru's agroforestry concessions (AC) scheme: Enabling multi-level implementation of an innovative, transformative policy*. https://www.agrofor.info/wp-content/uploads/2022/05/XV-WFC_AgroFor_AgroforestryConcessions-PPT2_JLC-LD.pdf
- Carlson, K. M., Heilmayr, R., Gibbs, H. K., Noojipady, P., Burns, D. N., Morton, D. C., Walker, N. F., Paoli, G. D., & Kremen, C. (2017). Effect of oil palm sustainability certification on deforestation and fire in Indonesia. *Proceedings of the National Academy of Sciences*, 115(1), 121–126. <https://doi.org/10.1073/pnas.1704728114>
- Central African Forest Initiative. (2020). *National land use planning and forest monitoring—Gabon*. <https://www.cafi.org/countries/gabon/national-land-use-planning-and-forest-monitoring>
- Chatham House. (2023). *Data: Volume of crude palm oil exported in 2020*. [resourcetrade.earth. https://resourcetrade.earth/?year=2020&category=615&units=weight&autozoom=1](https://resourcetrade.earth/?year=2020&category=615&units=weight&autozoom=1)
- Chiang, M. L., & Reyes, M. (2021, July 7). *Peru's forestry authorities set to improve agroforestry concessions*. World Agroforestry. <https://www.worldagroforestry.org/blog/2021/07/07/peru-forestry-authorities-set-improve-agroforestry-concessions>
- Choiruzzad, S. A. B., Tyson, A., & Varkkey, H. (2021). The ambiguities of Indonesian Sustainable Palm Oil certification: Internal incoherence, governance rescaling and state transformation. *Asia Europe Journal*, 19(2), 189–208. <https://doi.org/10.1007/s10308-020-00593-0>
- Chowdhury, A., Samrat, A., & Devy, M. S. (2021). Can tea support biodiversity with a few “nudges” in management: Evidence from tea growing landscapes around the world. *Global Ecology and Conservation*, 31, Article e01801. <https://doi.org/10.1016/j.gecco.2021.e01801>
- Claus, R., Davel, R., & Belcher, B. (2019). *Support to the Development of Agroforestry Concessions in Peru (SUCCESS) project* (Evaluation report). The CGIAR Research Program on Forests, Trees and Agroforestry. <https://doi.org/10.17528/cifor/007935>
- Climate Funds Update. (2019). *Central African Forest Initiative (CAFI)*. <https://climatefundsupdate.org/the-funds/central-african-forest-initiative-cafi/>
- Conseil National Climat. (2020). *Gabon national results report: Results-based payments under the Central African Forest Initiative – Gabon partnership*. https://www.cafi.org/sites/default/files/2021-06/Gabon%20National%20Results%20Report_submitted_18Dec2020.pdf
- Conseil National Climat. (2021). *Gabon's proposed national REDD+ Forest Reference Level*. Gabonese Republic. https://redd.unfccc.int/files/gabon_frl_submitted_feb2021.pdf
- Convention on Biological Diversity. (2022, December 22). *COP15: Final text of Kunming-Montreal Global Biodiversity Framework*. <https://www.cbd.int/article/cop15-final-text-kunming-montreal-gbf-221222>



- Corporación ANALPES Perú S.A.C. (2021). *Estudio: Demanda potencial de café y cacao cero deforestación de futuras CUSAF en San Martín, Amazonas y Loreto* (in Spanish). AgroFor. https://www.agrofor.info/wp-content/uploads/2021/09/2021set_AgroFor_Estudio-demanda-cafe-y-cacao-cero-deforestacion-San-Martin-Lroeto-Amazonas.pdf
- Curtis, P. G., Slay, C. M., Harris, N. L., Tyukavina, A., & Hansen, M. C. (2018). Classifying drivers of global forest loss. *Science*, 361(6407), 1108–1111. <https://doi.org/10.1126/science.aau3445>
- Daniels, A. E., Bagstad, K., Esposito, V., Moulaert, A., & Rodriguez, C. M. (2010). Understanding the impacts of Costa Rica's PES: Are we asking the right questions? *Ecological Economics*, 69(11), 2116–2126. <https://doi.org/10.1016/j.ecolecon.2010.06.011>
- De La Torre Ugarte, T., Collado, M., Requejo, F., Gomez, X., & Heros, C. (2021). A deep decarbonization pathway for Peru's rainforest. *Energy Strategy Reviews*, 36, Article 100675. <https://doi.org/10.1016/j.esr.2021.100675>
- Díaz, C., & Madrigal, V. (2016). *Programa de Pago de Servicios Ambientales en Costa Rica, esquema financiero de reconocimiento de servicios ambientales* (in Spanish). Fondo Nacional de Financiamiento Forestal de Costa Rica. <https://mma.gob.cl/wp-content/uploads/2016/10/Cristian-Diaz-y-Victor-Madrigal-Costa-Rica.pdf>
- Economics Climate Environment. (2015). *Comparison of the ISPO, MSPO and RSPO standards*. <https://www.sustainablepalmoil.org/wp-content/uploads/sites/2/2015/09/Efecap-PO-Standards-Comparison.pdf>
- Elder, S. (2023). *Reducing poverty: Voluntary sustainability standards can support smallholder farmers*. International Institute for Sustainable Development. <https://www.iisd.org/system/files/2023-04/ssi-brief-reducing-poverty-vss-support-smallholder-farmers.pdf>
- Elder, S., Wilkings, A., Larrea, C., Elamin, N., & Fernandez de Cordoba, S. (2021). *IISD's state of sustainability initiatives review: Standards and poverty reduction*. International Institute for Sustainable Development. <https://www.iisd.org/system/files/2021-12/ssi-initiatives-review-standards-poverty-reduction.pdf>
- Environmental Investigation Agency. (2020). *A false hope? An analysis of the new draft Indonesia Sustainable Palm Oil (ISPO) regulations*. <https://eia-international.org/report/a-false-hope-an-analysis-of-the-new-draft-indonesia-sustainable-palm-oil-ispo-regulations/>
- Environmental Investigation Agency. (2022). *Creating clarity: An analysis of the challenges and opportunities in the new Indonesian Sustainable Palm Oil (ISPO) certification scheme*. <https://kaoemtelapak.org/wp-content/uploads/2023/06/20221222-ISPO-Creating-Clarity-Interactive-Version-EN-compressed.pdf>
- Environment Law 7554 of 1995 (Ley Orgánica del Ambiente de 1995) [Costa Rica] http://www.pgrweb.go.cr/SCII/Busqueda/Normativa/Normas/nrm_texto_completo.aspx?param1=NRTC&nValor1=1&nValor2=27738&nValor3=93505&strTipM=TC



- Executive Management Resolution No. 081-2017-SERFOR/DE: Guidelines for the granting of transfer contracts in use for agroforestry systems” (Resolución de Dirección Ejecutiva No. 081-2017-SERFOR/DE: Lineamientos para el otorgamiento de contratos de cesión en uso para sistemas agroforestales) [Peru]. <https://faolex.fao.org/docs/pdf/per171777.pdf>
- FACT Dialogue. (2023). *What is the FACT Dialogue?* <https://www.factdialogue.org/>
- Finnegan, L. (2016). All voices heard: A conflict prevention approach to land and natural resources. In I. Chabay, M. Frick, & J. Helgeson (Eds.), *Land restoration: Reclaiming landscapes for a sustainable future* (pp. 405–418). Elsevier. <https://doi.org/10.1016/B978-0-12-801231-4.00018-5>
- Fondo Nacional de Financiamiento Forestal. (2018). *Objetivos* (in Spanish). <https://www.fonafifo.go.cr/es/conozcanos/objetivos/>
- Fondo Nacional de Financiamiento Forestal. (2022a). *Programa de Pago por Servicios Ambientales. Montos a reconocer para las diferentes actividades PSA en el año 2022* (Resolución No. R-0066-2022-MINAE) (in Spanish). <https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.fonafifo.go.cr%2Fmedia%2F3566%2F7-montos-a-reconocer.docx&wdOrigin=BROWSELINK>
- Fondo Nacional de Financiamiento Forestal. (2022b). *Estadísticas de PSA: Distribución de las hectáreas y árboles por actividad PSA* (in Spanish). <https://www.fonafifo.go.cr/es/servicios/estadisticas-de-psa/>
- Food and Agriculture Organization of the United Nations. (2007). *Manual on deforestation, degradation, and fragmentation using remote sensing and GIS* (MAR-SFM Working Paper 5). Forestry Department. <https://www.fao.org/forestry/18222-045c26b711a976bb9d0d17386ee8f0e37.pdf>
- Food and Agriculture Organization of the United Nations. (2010, January 3). *Forest management—History. Rwanda*. <https://www.fao.org/forestry/country/61580/en/rwa/>
- Food and Agriculture Organization of the United Nations. (2012). *Voluntary guidelines on the responsible governance of tenure of land, fisheries and forests in the context of national food security*. <https://doi.org/10.4060/i2801e>
- Food and Agriculture Organization of the United Nations. (2016). *The state of the world’s forests 2016: Forests and agriculture: Land use challenges and opportunities*. <https://www.fao.org/documents/card/en/c/ffed061b-82e0-4c74-af43-1a999a443fbf>
- Food and Agriculture Organization of the United Nations. (2018). *The Forest and Landscape Restoration Mechanism – Peru*. <https://www.fao.org/in-action/forest-landscape-restoration-mechanism/our-work/countries/peru/ar/>
- Food and Agriculture Organization. (2020a). *Global forest resources assessment 2020—Gabon*. <https://fra-data.fao.org/assessments/fra/2020/GAB/home/overview/>
- Food and Agriculture Organization of the United Nations. (2020b). *Global forest resources assessment 2020—Indonesia*. <https://fra-data.fao.org/assessments/fra/2020/IDN/sections/extentOfForest/>



- Food and Agriculture Organization of the United Nations. (2020c). *Global forest resources assessment 2020—Peru*. <https://fra-data.fao.org/assessments/fra/2020/PER/home/overview>
- Food and Agriculture Organization of the United Nations. (2020d). *Global forest resources assessment 2020—Rwanda*. <https://fra-data.fao.org/assessments/fra/2020/RWA/home/overview>
- Food and Agriculture Organization of the United Nations. (2020e). *Natural forest management*. <https://www.fao.org/forestry/sfm/85084/en/>
- Food and Agriculture Organization of the United Nations. (2021). *Case study: Costa Rica*. <https://www.fao.org/3/cb5929en/cb5929en.pdf>
- Food and Agriculture Organization of the United Nations. (2022). *The state of the world's forests 2022: Forest pathways for green recovery and building inclusive, resilient and sustainable economies*. <https://doi.org/10.4060/cb9360en>
- Food and Agriculture Organization of the United Nations. (2023). *Sustainable forest management (SFM) toolbox: Forest certification*. <https://www.fao.org/sustainable-forest-management/toolbox/modules/forest-certification/basic-knowledge/en/>
- Food and Agriculture Organization of the United Nations & UN Environment Programme (Eds.). (2020). *The state of the world's forests 2020: Forest, biodiversity and people*. <https://www.unep.org/resources/state-worlds-forests-forests-biodiversity-and-people>
- Forest Law 7575 (Ley Forestal 7575) (1996) [Costa Rica]. http://www.pgrweb.go.cr/scij/Busqueda/Normativa/Normas/nrm_texto_completo.aspx?param1=NRTC&nValor1=1&nValor2=41661&nValor3=94526&strTipM=TC
- Forest Stewardship Council. (n.d.). *Controlled wood*. <https://ca.fsc.org/ca-en/controlled-wood>
- Forest Stewardship Council. (2019, March). *Report on the structure of the FSC certification system* (Version 3). https://connect.fsc.org/sites/default/files/2022-08/FSC-RP-FSC_Certification_system_V3_EN_2019-03.pdf
- Forest Stewardship Council. (2020a, March 20). *Actualités: Signature d'un accord de coopération entre le gouvernement gabonais et le FSC International*. <https://be.fsc.org/be-fr/newsfeed/signature-dun-accord-de-cooperation-entre-le-gabon-et-fsc>
- Forest Stewardship Council. (2020b, July 21). *Peru reaches 1 million FSC-certified hectares during the health crisis*. <https://fsc.org/en/newscentre/general-news/peru-reaches-1-million-fsc-certified-hectares-during-the-health-crisis>
- Forest Stewardship Council. (2021a). *FSC consumer insights 2021: Global report*. https://fsc.org/sites/default/files/2021-11/FSC%20Consumer%20Insights_External%20deck_v6.pdf
- Forest Stewardship Council. (2021b). *FSC-STD-GAB-02-2020: FSC Forest Stewardship Standard for Gabon* (Forest Stewardship Standards [FSS] V[2-0]). [https://connect.fsc.org/document-centre/documents/resource/273#:~:text=This%20standard%20is%20designed%20to,\(Version%20%2D0\)](https://connect.fsc.org/document-centre/documents/resource/273#:~:text=This%20standard%20is%20designed%20to,(Version%20%2D0))
- Forest Stewardship Council. (2021c). *FSC-STD-40-004: Chain of Custody Certification Standard (STD) (V3-1)*. <https://connect.fsc.org/document-centre/documents/resource/302>



- Forest Stewardship Council. (2021d). *How FSC Congo Basin is working to certify 15 million hectares of Gabon's forest concessions*. <https://fsc.org/en/newscentre/general-news/how-fsc-congo-basin-is-working-to-certify-15-million-hectares-of-gabons>
- Forest Stewardship Council. (2022). *FSC-certified area in Gabon grows by 180,000 hectares*. <https://fsc.org/en/newscentre/events/fsc-certified-area-in-gabon-grows-by-180000-hectares>
- Forest Stewardship Council. (2023). *FSC-STD-01-001: FSC Principles and Criteria for Forest Stewardship (V5-3)*. <https://connect.fsc.org/document-centre/documents/resource/392>
- Forest Stewardship Council. (2024). *What's in a label?* <https://fsc.org/en/what-the-fsc-labels-mean>
- Forestry and Wildlife Law N° 29763 of 2015 (Ley Forestal y de Fauna Silvestre N° 29763 de 2015) [Peru]. <https://www.leyes.congreso.gob.pe/Documentos/Leyes/29763.pdf>
- Furumo, P. R., & Lambin, E. F. (2020). Scaling up zero-deforestation initiatives through public-private partnerships: A look inside post-conflict Colombia. *Global Environmental Change*, 62, Article 102055. <https://doi.org/10.1016/j.gloenvcha.2020.102055>
- Gaveau, D. L. A., Locatelli, B., Salim, M. A., Husnayaen, Manurung, T., Descals, A., Angelsen, A., Meijaard, E., & Sheil, D. (2022). Slowing deforestation in Indonesia follows declining oil palm expansion and lower oil prices. *PLOS ONE*, 17(3), Article e0266178. <https://doi.org/10.1371/journal.pone.0266178>
- Global Forest Watch. (n.d.). Indonesia. Indonesia primary forest loss, 2002–2022; Tree cover loss in Indonesia. *Share Dashboard*. <https://tinyurl.com/5n794c4j>
- GLOBALG.A.P. (2022). *Summary of changes from IFA V5 to IFA V6 Smart and GFS editions* (English version 1.0_Sep22). https://www.globalgap.org/.content/galleries/documents/220929_Summary_of_changes_IFA_v5_to_v6_GFS-Smart_en.pdf
- Global Green Growth Institute. (2020). *PE05: Mitigating deforestation in Peru through land use formalization*. <https://gggi.org/project/project-reference-profiles-perupe05-mitigating-deforestation-in-peru-through-land-use-formalization/>
- Gutierrez, Y., & Chiang, M. L. (2023, April 26). *Las CUSAF, una oportunidad para los bosques, los agricultores y los paisajes de Perú*. CIFOR-ICRAF Forests News. <https://forestsnews.cifor.org/82478/las-cusaf-una-oportunidad-para-los-bosques-los-agricultores-y-los-paisajes-de-peru?fnl=>
- Hidayat, N. K., Offermans, A., & Glasbergen, P. (2018). Sustainable palm oil as a public responsibility? On the governance capacity of Indonesian Standard for Sustainable Palm Oil (ISPO). *Agriculture and Human Values*, 35(1), 223–242. <https://doi.org/10.1007/s10460-017-9816-6>
- Higgins, V., & Richards, C. (2019). Framing sustainability: Alternative standards schemes for sustainable palm oil and South–South trade. *Journal of Rural Studies*, 65, 126–134. <https://doi.org/10.1016/j.jrurstud.2018.11.001>



- Höhl, M., Ahimbisibwe, V., Stanturf, J. A., Elsasser, P., Kleine, M., & Bolte, A. (2020). Forest landscape restoration—What generates failure and success? *Forests*, 11(9), Article 938. <https://doi.org/10.3390/f11090938>
- Hosonuma, N., Herold, M., De Sy, V., De Fries, R. S., Brockhaus, M., Verchot, L., Angelsen, A., & Romijn, E. (2012). An assessment of deforestation and forest degradation drivers in developing countries. *Environmental Research Letters*, 7(4), Article 044009. <https://doi.org/10.1088/1748-9326/7/4/044009>
- Indonesia Sustainable Palm Oil. (2023). *Myth/fact*. <https://www.indonesiapalmoilfacts.com/ispo/> <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC195054/>
- InfoSawit. (2021). ISPO Certification covers 35% of oil plant plantations in Indonesia. 2 September 2021. <https://en.infosawit.com/news/8928/-ispo-certification-covers-35-percent-of-oil-palm-plantations-in-indonesia>
- Ingram, V. J., Behagel, J., Mammadova, A., & Verschuur, X. (2020). *The outcomes of deforestation-free commodity value chain approaches*. <https://www.wur.nl/en/project/outcomes-of-deforestation-free-commodity-value-chain-approaches.htm>
- International Institute for Environment and Development. (2023). *Markets and payments for environmental services*. <https://www.iied.org/markets-payments-for-environmental-services>
- International Institute for Sustainable Development. (2021). *Reducing deforestation and enhancing forest conservation through international trade policy* [Webinar presentation]. <https://www.iisd.org/ssi/wp-content/uploads/2021/03/Trade-and-Foresty-Webinar-Presentation-March-24-2021.pdf>
- International Monetary Fund. (2019). *Gabon: Selected issues. IMF country reports*. <https://www.imf.org/en/Publications/CR/Issues/2019/12/23/Gabon-Selected-Issues-48915>
- International Union for Conservation of Nature. (2020a). *Bonn Challenge—About the challenge*. <https://www.bonnchallenge.org/about>
- International Union for Conservation of Nature. (2020b, March 31). *How Rwanda became a restoration leader*. <https://www.iucn.org/news/forests/202003/how-rwanda-became-a-restoration-leader>
- Jack, B. K., Kousky, C., & Sims, K. R. E. (2008). Designing payments for ecosystem services: Lessons from previous experience with incentive-based mechanisms. *Proceedings of the National Academy of Sciences*, 105(28), 9465–9470. <https://doi.org/10.1073/pnas.0705503104>
- Jong, H. N. (2019, August 14). *Indonesia forest-clearing ban is made permanent, but labeled ‘propaganda.’* Mongabay Environmental News. <https://news.mongabay.com/2019/08/indonesia-forest-clearing-ban-is-made-permanent-but-labeled-propaganda/>
- Jong, H. N. (2022, March 15). *Study: Indonesia’s forest-clearing moratorium underdelivered—But so did donors*. Mongabay Environmental News. <https://news.mongabay.com/2022/03/study-indonesias-forest-clearing-moratorium-underdelivered-but-so-did-donors/>



- Kaoem Telapak & Environmental Investigation Agency. (2021). *Deforestation and deregulation – Indonesia’s policies and implications for its palm oil sector*. <https://eia-international.org/report/deforestation-and-deregulation-indonesias-policies-and-implications-for-its-palm-oil-sector/>
- Karch, K., Arakwiye, B., Shiferaw, M., Uzamukunda, A., Muvunankiko, G., Giri, K., & Ng’oma, S. (2023, May 30). *Landscape restoration is complex, but multi-stakeholder platforms can help*. <https://afr100.org/node/427>
- Kehati & SPOS. (2022, June). *The comparison of ISPO and RSPO Certification to achieve sustainable palm oil production in Indonesia* (Information brief). <https://sposindonesia.org/wp-content/uploads/2022/06/Information-Brief- THE-COMPARISON-OF-ISPO-and-RSPO-SPOSI-KEHATI.pdf>
- Kleinn, C., Corrales, L., & Morales, D. (2002). Forest area in Costa Rica: A comparative study of tropical forest cover estimates over time. *Environmental Monitoring and Assessment*, 73(1), 17–40. <https://doi.org/10.1023/A:1012659129083>
- Kometter, R. (2019). *Evaluación del Modelo de Concesiones Forestales con Fines Maderables en el Perú, que Compila los Análisis: Legal, Técnico y Económico Financiero, así como la Propuesta Normativa para el Fortalecimiento del Modelo* (in Spanish). <https://doi.org/10.13140/RG.2.2.25512.39685>
- Lamb, D., Stanturf, J., & Madsen, P. (2012). What is forest landscape restoration? In J. Stanturf, D. Lamb, & P. Madsen (Eds.), *Forest landscape restoration. World forests* (Vol. 15, pp. 3–23). Springer Dordrecht. https://doi.org/10.1007/978-94-007-5326-6_1
- Lansing, D. M. (2017). Understanding smallholder participation in payments for ecosystem services: The case of Costa Rica. *Human Ecology*, 45(1), 77–87. <https://doi.org/10.1007/s10745-016-9886-x>
- Larrea, C., Leal, S., Sarmiento, F., & Voora, V. (2021). *Voluntary sustainability standards, forest conservation, and environmental provisions in international trade policy*. International Institute for Sustainable Development. <https://www.iisd.org/system/files/2021-10/voluntary-sustainability-standards-forest-conservation-trade-policy.pdf>
- Larson, A. M., Brockhaus, M., Sunderlin, W. D., Duchelle, A., Babon, A., Dokken, T., Pham, T. T., Resosudarmo, I. A. P., Selaya, G., Awono, A., & Huynh, T.-B. (2013). Land tenure and REDD+: The good, the bad and the ugly. *Global Environmental Change*, 23(3), 678–689. <https://doi.org/10.1016/j.gloenvcha.2013.02.014>
- Law 016-01 on the Forest Code in the Gabonese Republic, 2001 (Loi n° 016-01 portant code forestier en République gabonaise 2001) [Gabon]. [https://www.fao.org/faolex/results/details/fr/c/LEX-FAOC029255/#:~:text=La%20présente%20loi%20portant%20Code,des%20ressources%20forestières%20\(II\)](https://www.fao.org/faolex/results/details/fr/c/LEX-FAOC029255/#:~:text=La%20présente%20loi%20portant%20Code,des%20ressources%20forestières%20(II))
- Le Coq, J.-F., Froger, G., Legrand, T., Pesche, D., & Saenz, F. (2011). *Continuity and inflexions of the program of payment for environmental services in Costa Rica: A learning process and stakeholders’ balance of power perspective* [Document de travail No. 2011-10]. Services environnementaux et usages de l’espace rural.



- Mansourian, S., Berrahmouni, N., Blaser, J., Dudley, N., Maginnis, S., Mumba, M., & Vallauri, D. (2021). Reflecting on twenty years of forest landscape restoration. *Restoration Ecology*, 29(7), Article e13441. <https://doi.org/10.1111/rec.13441>
- Marx, A., Depoorter, C., & Vanhaecht, R. (2022). Voluntary sustainability standards: State of the art and future research. *Standards*, 2(1), 14–31. <https://doi.org/10.3390/standards2010002>
- McBreen, J., & Jewell, N. (2023). *Forest landscape restoration interventions*. International Union for Conservation of Nature and Natural Resources. <https://portals.iucn.org/library/sites/library/files/documents/2023-001-En.pdf>
- McInnes, A. (2017). *A comparison of leading palm oil certification standards*. Forest Peoples Programme. https://www.forestpeoples.org/sites/default/files/documents/Palm%20Oil%20Certification%20Standards_lowres_spreads.pdf
- McLain, R., Lawry, S., Guariguata, M. R., & Reed, J. (2021). Toward a tenure-responsive approach to forest landscape restoration: A proposed tenure diagnostic for assessing restoration opportunities. *Land Use Policy*, 104, Article 103748. <https://doi.org/10.1016/j.landusepol.2018.11.053>
- Meier, C., Sampson, G., Larrea, C., Schlatter, B., Voora, V., Dang, D., Bermúdez, S., Wozniak, J., & Willer, H. (2020). *The state of sustainable markets 2020: Statistics and emerging trends*. International Trade Centre. <https://www.intracen.org/publication/Sustainable-Markets-2020/>
- Methodological Framework of the National Forestry and Wildlife Inventory through Executive Directorate Resolution n.º 253-2016-SERFOR-DE Forest, November 2, 2016 (Marco Metodológico del Inventario Nacional Forestal y de Fauna Silvestre mediante Resolución de Dirección Ejecutiva n.º 253-2016-SERFOR-DE. Bosque [Peru]. <https://faolex.fao.org/docs/pdf/per161159anx.pdf>
- Michida, E. (2023). *Effectiveness of self-regulating sustainability standards for the palm oil industry* (ERIA Discussion Paper Series No. 476). <https://www.eria.org/uploads/media/discussion-papers/FY23/Effectiveness-of-Self-Regulating-Sustainability-Standards-for-the-Palm-Oil-Industry.pdf>
- Ministerio del Ambiente, Peru. (2019). *Conociendo la Zonificación Ecológica y Económica (ZEE)*. Sistema Nacional de Información Ambiental. <https://www.minam.gob.pe/ordenamientoterritorial/zonificacion-ecologica-y-economica/>
- Ministry of Agriculture Regulation No 11/permentan/OT.140/2/2015 on the Indonesian Sustainable Palm Oil Certification System (Peraturan Menteri Pertanian Nomor 11/permentan/OT.140/2/2015 Tahun 2015 Tentang Sistem Sertifikasi Kelapa Sawit Berkelanjutan Indonesia. [Indonesia] <https://peraturan.go.id/id/permentan-no-11-permentan-ot-140-3-2015-tahun-2015>



- Ministry of Agriculture Regulation No.19/Permentan/OT.140/3/2011 on Guidelines for Indonesian Sustainable Palm Oil (Peraturan Menteri Pertanian Nomor 19/Permentan/OT.140/3/2011 Tahun 2011. <https://www.global-regulation.com/translation/indonesia/7210293/regulation-of-the-minister-of-agriculture-number-19-permentan-ot-140-3-2011-in-2011.html>
- Ministry of Agriculture Regulation No 38 Year 2020 on the Implementation of Sustainable Palm Oil Plantation (Peraturan Menteri Pertanian Republik Indonesia Nomor 38 Tahun 2020 tentang Penyelenggaraan Sertifikasi Perkebunan Kelapa Sawit Berkelanjutan Indonesia). https://peraturan.go.id/files2/permentan-no-38-tahun-2020_terjemah.pdf
- Ministry of Environment. (2019). *Rwanda forest cover mapping*. Republic of Rwanda. https://www.environment.gov.rw/fileadmin/user_upload/Moe/Publications/Reports/Forest_cover_report_2019.pdf
- Minister of Forestry Regulation Number: P.14/Menhut-II/2004 (Peraturan Menteri Kehutanan Nomor: P.14/Menhut-II/2004 Tentang Tata Cara Aforestasi dan Reforestasi Dalam Kerangka Mekanisme Pembangunan Bersih) [Indonesia].
- Mongabay. (2021, July 22). *Gabon becomes first African country to get paid for forest protection*. Earth.Org. <https://earth.org/gabon-paid-forest-protection/>
- Mongabay. (2022). *Deforestation statistics for Peru*. <https://rainforests.mongabay.com/deforestation/archive/Peru.htm>
- Moodley, V., Gahima, A., & Munien, S. (2010). Environmental causes and impacts of the genocide in Rwanda: Case studies of the towns of Butare and Cyangugu. *African Journal on Conflict Resolution*, 2010(2). <https://www.accord.org.za/ajcr-issues/environmental-causes-and-impacts-of-the-genocide-in-rwanda/>
- Mosnier A., Boere E., Reumann A., Yowargana P., Pirker J., Havlik P., & Pacheco P. (2017). *Palm oil and likely futures: Assessing the potential impacts of zero deforestation commitments and a moratorium on large-scale oil palm plantations in Indonesia*. Center for International Forestry Research. <https://doi.org/10.17528/cifor/006468>
- Mukuralinda, A., Ndayambaje, J., Iiyama, M., Ndoli, A., Musana, B., Garrity, D., & Ling, S. (2016). *Taking to scale tree-based systems in Rwanda to enhance food security, restore degraded land, improve resilience to climate change and sequester carbon*. PROFOR. https://www.profor.info/sites/profor.info/files/TakingToScaleRwanda_low.pdf
- Murguia, J. M., Ordoñez, P., Corral, L., & Navarrete-Chacón, G. (2022). *Payment for ecosystem services in Costa Rica: Evaluation of a country-wide program*. Inter-American Development Bank. <https://doi.org/10.18235/0004259>
- Ndiaye, A. (2021, December 28). *Environnement: Le Gabon revoit ses ambitions de certification forestière a 2025* (in French). MEDIAS241. <https://medias241.com/environnement-le-gabon-revoit-ses-ambitions-de-certification-forestiere-a-2025/>
- Nyungwe Forest National Park. (2023). *Home page*. <https://www.nyungweforestnationalpark.org>



- Oeschger, A., & Sarmiento, F. (2022). *Due diligence requirements to tackle deforestation: An overview of the EU and British proposals*. International Institute for Sustainable Development. <https://www.iisd.org/articles/policy-analysis/deforestation-overview-eu-british-proposals>
- Oldekop, J. A., Rasmussen, L. V., Agrawal, A., Bebbington, A. J., Meyfroidt, P., Bengston, D. N., Blackman, A., Brooks, S., Davidson-Hunt, I., Davies, P., Dinsi, S. C., Fontana, L. B., Gumucio, T., Kumar, C., Kumar, K., Moran, D., Mwampamba, T. H., Nasi, R., Nilsson, M., ... Wilson, S. J. (2020). Forest-linked livelihoods in a globalized world. *Nature Plants*, 6(12), 1400–1407. <https://doi.org/10.1038/s41477-020-00814-9>
- Pagiola, S. (2008). Payments for environmental services in Costa Rica. *Ecological Economics*, 65(4), 712–724. <https://doi.org/10.1016/j.ecolecon.2007.07.033>
- Panlasigui, S., Rico-Straffon, J., Pfaff, A., Swenson, J., & Loucks, C. (2018). Impacts of certification, uncertified concessions, and protected areas on forest loss in Cameroon, 2000 to 2013. *Biological Conservation*, 227, 160–166. <https://doi.org/10.1016/j.biocon.2018.09.013>
- Pasimura, I., Afrizal, A., & Novarino, W. (2022). Impact of Indonesian Sustainable Palm Oil (ISPO) certification to environmental behavior of palm oil plantation companies. *International Journal of Agriculture System*, 10(1), 26. <https://doi.org/10.20956/ijas.v10i1.3254>
- Pérez, C. I. (2009). Payment for environmental services: What can we learn from Costa Rica? In S. Appanah, E. Mansur, & R. Krezdorn (Eds.), *Strategies and financial mechanisms for sustainable use and conservation of forests: Experiences from Latin America and Asia*. FAO Regional Office for Asia and the Pacific.
- Peteru, S., Komarudin, H., & Brady, M. A. (2022). *Sustainability certifications, approaches, and tools for oil palm in Indonesia and Malaysia*. European Forest Institute. <https://hdl.handle.net/10568/128146>
- Pico-Mendoza, J., Pinoargote, M., Carrasco, B., & Limongi Andrade, R. (2020). Ecosystem services in certified and non-certified coffee agroforestry systems in Costa Rica. *Agroecology and Sustainable Food Systems*, 44(7), 902–918. <https://doi.org/10.1080/21683565.2020.1713962>
- Pirard, R., Pacheco, P., & Romero, C. (2023). The role of hybrid governance in supporting deforestation-free trade. *Ecological Economics*, 210, Article 107867. <https://doi.org/10.1016/j.ecolecon.2023.107867>
- Pokorny, B., Robiglio, V., Reyes, M., Vargas, R., & Patiño Carrera, C. F. (2021). The potential of agroforestry concessions to stabilize Amazonian forest frontiers: A case study on the economic and environmental robustness of informally settled small-scale cocoa farmers in Peru. *Land Use Policy*, 102, Article 105242. <https://doi.org/10.1016/j.landusepol.2020.105242>
- Porrás, I., Barton, D. N., Miranda, M., & Chacón-Cascante, A. (2013). *Learning from 20 years of Payments for Ecosystem Services in Costa Rica*. International Institute for Environment and Development. <https://www.ied.org/sites/default/files/pdfs/migrate/16514IIED.pdf>



- Porras, I., & Chacón-Cascante, A. (2018). *Costa Rica's payments for ecosystem services programme: Case study module 2*. International Institute for Environment and Development. <https://www.espa.ac.uk/files/espa/Costa%20Rica.pdf>
- Potts, J., Daitchman, J., & Meer, J. van der. (2010). *The state of sustainability initiatives review 2010: Sustainability and transparency*. International Institute for Sustainable Development. <https://www.iisd.org/publications/state-sustainability-initiatives-review-2010-sustainability-and-transparency>
- Regulation of the President of the R.I. No. 44 of 2020 on the certification system for sustainable palm oil Plantation in Indonesia (Peraturan Presiden Republik Indonesia Nomor 44 Tahun 2020 Tentang Sistem Sertifikasi Perkebunan Kelapa Sawit Berkelanjutan Indonesia). FAOLEX Database. <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC195054/>
- Republic of Costa Rica. (2020). Manual de Prodedimientos para el Programa de Pago de Servicios Ambientales. *Alcance no. 97 a la Gaceta no. 80* [Costa Rica]. <https://onfcr.org/wp-content/uploads/Manual-de-Procedimientos-PSA-2020-14-abril-2020.pdf>
- Republic of Rwanda. (n.d.). *How Rwanda is putting its forests first in the fight against climate change*. <https://www.environment.gov.rw/news-detail/how-rwanda-is-putting-its-forests-first-in-the-fight-against-climate-change>
- Republic of Rwanda. (2009). *Strategic plan for the transformation of agriculture in Rwanda – Phase II (PSTA II)*. http://rwanda.countrystat.org/fileadmin/user_upload/countrystat_fenix/congo/docs/PSTA_II-php.pdf
- Republic of Rwanda. (2010). *National Forestry Policy*. <https://faolex.fao.org/docs/pdf/rwa149689.pdf>
- Republic of Rwanda. (2017). *Forest Investment Program for Rwanda*. https://www.cif.org/sites/cif_enc/files/fip_final_rwanda.pdf
- Republic of Rwanda. (2018). *Rwanda National Forestry Policy 2018*. <https://faolex.fao.org/docs/pdf/rwa215518.pdf>
- Republic of Rwanda & International Union for Conservation of Nature. (2022, November 29). *A thousand hills turn green: How Rwanda became a leader in forest landscape restoration*. <https://iucn.maps.arcgis.com/apps/MapJournal/index.html?appid=0c40be7f83c64bb9b7c8f3372358c6f9>
- Republic of Rwanda, International Union for Conservation of Nature, & World Resources Institute. (2014). *Forest landscape restoration: Opportunity assessment for Rwanda*. <https://portals.iucn.org/library/sites/library/files/documents/2014-077.pdf>
- Rietbergen-McCracken, J., Maginnis, S., & Sarre, A. (Eds.). (2008). *The forest landscape restoration handbook*. Earthscan.
- Ritchie, H. (2021). *Is our appetite for soy driving deforestation in the Amazon?* Our World in Data. <https://ourworldindata.org/soy>



- Robalino, J., & Pfaff, A. (2013). Ecopayments and deforestation in Costa Rica: A nationwide analysis of PSA's initial years. *Land Economics*, 89(3), 432–448. <https://doi.org/10.3368/le.89.3.432>
- Robalino, J., Pfaff, A., Sandoval, C., & Sanchez-Azofeifa, G. A. (2021). Can we increase the impacts from payments for ecosystem services? Impact rose over time in Costa Rica, yet spatial variation indicates more potential. *Forest Policy and Economics*, 132, Article 102577. <https://doi.org/10.1016/j.forpol.2021.102577>
- Robiglio, V., & Mesia, N. (2018). La cesión en uso para sistemas agroforestales: Aspectos legales, prescripciones técnicas y de manejo por productores familiares (in Spanish). In *Apoyo al Desarrollo de Cesión en Uso para Sistemas Agroforestales en Perú*. Oficina Regional para América Latina, Centro Internacional de Investigación Agroforestal. [https://www.worldagroforestry.org/sites/default/files/users/admin/mo%CC%81dulo%201_PDF%20\(2\).pdf](https://www.worldagroforestry.org/sites/default/files/users/admin/mo%CC%81dulo%201_PDF%20(2).pdf)
- Rougier, F. (2012, September 24). *Preliminary feedback on FSC certification from an operator's point of view – Private sector & development*. <https://blog.private-sector-and-development.com/2012/09/24/preliminary-feedback-on-fsc-certification/>
- Sánchez-Azofeifa, G. A., Pfaff, A., Robalino, J. A., & Boomhower, J. P. (2007). Costa Rica's payment for environmental services program: Intention, implementation, and impact. *Conservation Biology*, 21(5), 1165–1173. <https://doi.org/10.1111/j.1523-1739.2007.00751.x>
- Searcey, D. (2022, November 3). Can a nation replace its oil wealth with trees? *The New York Times*. <https://www.nytimes.com/2022/11/03/climate/gabon-logging-oil-economy.html>
- Sen. Schatz, B. [D-HI]. (2021, October 6). FOREST Act, S.2950—117th Congress (2021–2022). <https://www.congress.gov/bill/117th-congress/senate-bill/2950/text>
- Shanee, N., & Shanee, S. (2016). Land trafficking, migration, and conservation in the “no-man's land” of northeastern Peru. *Tropical Conservation Science*, 9(4). <https://doi.org/10.1177/1940082916682957>
- Sistema Nacional de Monitoreo, Cobertura, Uso de la Tierra y Ecosistemas. (2023). *Home page*. <https://simocute.go.cr/home>
- Stanturf, J. A., Kleine, M., Mansourian, S., Parrotta, J., Madsen, P., Kant, P., Burns, J., & Bolte, A. (2019). Implementing forest landscape restoration under the Bonn Challenge: A systematic approach. *Annals of Forest Science*, 76(2), Article 50. <https://doi.org/10.1007/s13595-019-0833-z>
- Stanturf, J. A., & Mansourian, S. (2020). Forest landscape restoration: State of play. *Royal Society Open Science*, 7(12), Article 201218. <https://doi.org/10.1098/rsos.201218>
- Statista. (2023). *Export volume of palm oil worldwide in 2022/23, by leading country*. <https://www.statista.com/statistics/620219/palm-oil-export-volume-worldwide-by-country/>



- Suharto, R., Husein, K., Sartono, Kusumadewi, D., Darussamin, A., Nedyasari, D., Riksanto, D., Mutuagung, H., Rahman, A., Uno, T., Gillespie, P., Arianto, C., & Prasodjo, R. (2015). *Joint study on the similarities and differences of the ISPO and the RSPO certification systems*. Ministry of Agriculture of the Republic of Indonesia & Roundtable on Sustainable Palm Oil. https://www.undp.org/sites/g/files/zskgke326/files/migration/gcp/ISPO-RSPO-Joint-Study_English_N-8-for-screen.pdf
- Sunderlin, W. D., Larson, A. M., & Cronkleton, P. (2009). Forest tenure rights and REDD+. In A. Angelsen (Ed.), *Realising REDD+: National strategy and policy options* (pp. 139–150). https://www.cifor.org/publications/pdf_files/Books/BAngelsen0902.pdf
- Tafoya, K. A., Brondizio, E. S., Johnson, C. E., Beck, P., Wallace, M., Quirós, R., & Wasserman, M. D. (2020). Effectiveness of Costa Rica’s conservation portfolio to lower deforestation, protect primates, and increase community participation. *Frontiers in Environmental Science*, 8. <https://www.frontiersin.org/articles/10.3389/fenvs.2020.580724>
- Toto, E. (2023, May 10). *Corruption threatens timber traceability in Nkok, Gabon*. Mongabay Environmental News. <https://news.mongabay.com/2023/05/corruption-threatens-timber-traceability-in-nkok-gabon/>
- Tritsch, I., Le Velly, G., Mertens, B., Meyfroidt, P., Sannier, C., Makak, J.-S., & Hounbedji, K. (2020). Do forest-management plans and FSC certification help avoid deforestation in the Congo Basin? *Ecological Economics*, 175, Article 106660. <https://doi.org/10.1016/j.ecolecon.2020.106660>
- Tropenbos Indonesia. (2020). *New ISPO: A new hope to strengthen oil-palm governance?* https://www.tropenbos-indonesia.org/file.php/2198/202010_infobrief_ispo-english.pdf
- Tropical Forest Alliance. (2019, January 22). *Peru joins Tropical Forest Alliance to stop deforestation and protect biodiversity in the Amazon* [Press release]. <https://www.tropicalforestalliance.org/en/news-and-events/news/peru-joins-tropical-forest-alliance-stop-deforestation-protect-biodiversity-amazon>
- UN Climate Change Conference UK 2021. (2021, November 2). *Glasgow Leaders’ Declaration on Forests and Land Use*. <https://ukcop26.org/glasgow-leaders-declaration-on-forests-and-land-use/>
- United Nations. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development*. <https://sdgs.un.org/2030agenda>
- United Nations Climate Change. (2019, March 4). *Costa Rica commits to fully decarbonize by 2050*. <https://unfccc.int/news/costa-rica-commits-to-fully-decarbonize-by-2050>
- United Nations Conference on Trade and Development. (2023). *Understanding voluntary sustainability standards: A strengths, weaknesses, opportunities, and threats analysis*. United Nations. https://unctad.org/system/files/official-document/ditctab2023d3_en.pdf
- United Nations Department of Economic and Social Affairs. (2018, March 20). *Safeguarding the world’s forests – Our best bet for sustainable societies*. <https://www.un.org/development/desa/en/news/forest/international-day-forests-2018.html>



- United Nations Development Programme. (2017). *Costa Rica scores major environmental win with launch of world-first land use monitoring system*. Food and Agricultural Commodity Systems. <https://www.undp.org/facs/news/costa-rica-scores-major-environmental-win-launch-world-first-land-use-monitoring-system>
- United Nations Environment Programme. (2021). *Gabon receives first payment for reducing CO2 emissions under historic CAFE agreement*. <https://www.undp.org/geneva/press-releases/gabon-receives-first-payment-reducing-co2-emissions-under-historic-cafe-agreement>
- United Nations Environment Programme. (2023). *Interactive Country Fiches—Rwanda—Forest*. <https://dicf.unepgrid.ch/rwanda/forest>
- United Nations Environment Programme & Food and Agriculture Organization of the United Nations. (2021). *About the UN Decade*. UN Decade on Restoration. <http://www.decadeonrestoration.org/about-un-decade>
- United Nations Forum on Sustainability Standards. (2013). *Voluntary sustainability standards: Today's landscape of issues & initiatives to achieve public policy objectives*. https://unfss.org/wp-content/uploads/2012/05/unfss-report-issues-1_draft_lores.pdf
- United Nations Forum on Sustainability Standards. (2020). *Scaling up voluntary sustainability standards through sustainable public procurement and trade policy*. https://unfss.org/wp-content/uploads/2020/10/UNFSS-4th-Report_revised_12Oct2020.pdf
- United Nations Forum on Sustainability Standards. (2022). *Voluntary sustainability standards sustainability agenda and developing countries: Opportunities and challenges*. https://unfss.org/wp-content/uploads/2022/10/UNFSS-5th-Report_14Oct2022_rev.pdf
- United Nations Forum on Sustainability Standards. (2023). *Voluntary sustainability standards in international trade*. https://unctad.org/system/files/official-document/unfss_4th_2020_en.pdf
- United Nations Framework Convention on Climate Change. (n.d.). *Payments for Environmental Services Program—Costa Rica*. <https://unfccc.int/climate-action/momentum-for-change/financing-for-climate-friendly-investment/payments-for-environmental-services-program>
- UN-REDD. (2023). *Forest landscape restoration*. UN-REDD Programme. <https://www.un-redd.org/work-areas/forest-landscape-restoration>
- Uwiragiye, C., & Maniragaba, A. (2020). *The impact of population growth on natural forests in Rwanda*. <https://doi.org/10.5281/ZENODO.4297903>
- van Dijk, S., Stas, S., & van Benthem, M. (2020). *Providing insights in certification schemes for sustainable forest management in Gabon*. Stichting Probos. https://www.probos.nl/images/pdf/rapporten/Rap2020_Study_certification_schemes_Gabon_Octobre-2020.pdf
- Voorra, V., Larrea, C., Bermudez, S., & Baliño, S. (2019). *Global market report: Palm oil*. International Institute for Sustainable Development. <https://www.iisd.org/system/files/publications/ssi-global-market-report-palm-oil.pdf>



- Voora, V., Larrea, C., Huppe, G., & Nugnes, F. (2022). *IISD's State of Sustainability Initiatives review: Standards and investments in sustainable agriculture review*. International Institute for Sustainable Development. <https://www.iisd.org/system/files/2022-04/ssi-initiatives-review-standards-investments-agriculture.pdf>
- Watson, V., Cervantes, S., Castro, C., Mora, L., Solis, M., Porras, I. T., & Cornejo, B. (1998). *Making space for better forestry: Costa Rica study*. International Institute for Environment and Development. <https://www.iied.org/sites/default/files/pdfs/migrate/7530IIED.pdf>
- World Agroforestry Centre. (2017). *Support to the development of agroforestry concessions in Peru*. <https://www.worldagroforestry.org/project/support-development-agroforestry-concessions-peru>
- World Bank. (2019). *Gabon – REDD+ Readiness project information document*. <https://documents1.worldbank.org/curated/en/141281569299034895/pdf/Gabon-REDD-Readiness-Project.pdf>
- World Bank. (2022a). *Costa Rica*. <https://www.worldbank.org/en/country/costarica/overview>
- World Bank. (2022b, October 24). *Journey into the Congo Basin – The lungs of Africa and beating heart of the world*. <https://www.worldbank.org/en/news/feature/2022/10/24/journey-into-the-congo-basin-the-lungs-of-africa-and-beating-heart-of-the-world>
- World Bank. (2022c, August 12). *Costa Rica receives first emission reductions payment from forest carbon partnership facility*. <https://www.worldbank.org/en/news/press-release/2022/08/16/-costa-rica-receives-first-emission-reductions-payment-from-forest-carbon-partnership-facility>
- World Bank & International Center for Tropical Agriculture. (2015). *Climate-smart agriculture in Rwanda*. The World Bank Group. <https://climateknowledgeportal.worldbank.org/sites/default/files/2019-06/CSA%20RWANDA%20NOV%2018%202015.pdf>
- World Resources Institute. (n.d.). *Forest pulse: The latest on the world's forests*. Global Forest Review. <https://research.wri.org/gfr/latest-analysis-deforestation-trends>
- World Resources Institute. (2014, May 30). *Atlas of forest and landscape restoration opportunities*. <https://www.wri.org/data/atlas-forest-and-landscape-restoration-opportunities>
- World Resources Institute. (2024). *Forest landscape restoration principles*. Global Restorative Initiative. <https://www.wri.org/initiatives/global-restoration-initiative/forest-landscape-restoration-principles>
- Worm, L. (2020). *Can wood samples help save our forests and improve due diligence? Interview with Roger Young, Agroisolab, and Phil Guillery, FSC (No. 8)* [Audio podcast episode]. Forest Stewardship Council International. <https://open.fsc.org/handle/resource/455>
- World Wide Fund for Nature. (2023, December 5). *WWF-Perú celebra el aniversario Madre de Dios como cuna de la biodiversidad mostrando los aportes en su conservación y aprovechamiento sostenible de sus bosques* (in Spanish). <https://www.wwf.org.pe/?382850/WWF-Peru-celebra-el-aniversario-Madre-de-Dios-como-cuna-de-la-biodiversidad-mostrando-los-aportes-en-su-conservacion-y-aprovechamiento-sostenible-de-sus-bosques>



Appendix A. Voluntary Sustainability Standards

Voluntary sustainability standards (VSSs) began to emerge in the 1970s, and their number rose rapidly after the United Nations Conference for Sustainable Development in Rio de Janeiro in 1992. All VSSs are different. They vary in their design, implementation mechanisms, and assurance approaches. They normally consist of four main components:

- a set of socio-economic and environmental criteria that guide and regulate production practices and with which producers or operators must comply;
- the activities carried out to help them comply with these requirements;
- the procedures used to assess, verify, and certify the compliance of producing practices against these criteria; and
- the systems used to track and trace the product as it moves through the value chain—from the origin farm to the market—and preserve its integrity as VSS-compliant through the use of different chain-of-custody models (Larrea et al., 2021).

In exchange for adopting more sustainable production practices, producers and operators can sell their goods in the marketplace with a label that differentiates them from conventional options and attract more socially and environmentally focused consumers. In the past 3 decades, demand for VSS-compliant products has increased rapidly in Europe and North America while developing slowly in the Global South. Consumer demand for more sustainable products goes hand-in-hand with the proliferation of corporate sustainability commitments. Moreover, regulations have also driven this demand for more sustainable products, which has opened market opportunities for VSS-compliant producers in the Global South with often improved prices. Though VSS-compliant items have taken from 10% to 15% of the market share in certain commodities and markets (i.e., banana, cocoa), there is still room for growth. In some cases, VSS-compliant products are sold as conventional, which prevents producers from benefiting from higher prices and premiums and recovering the cost of complying with the certification (Meier et al., 2020).

About 450 VSSs operate worldwide across sectors, especially in agriculture (United Nations Forum on Sustainability Standards, 2022), including in commodities that are the main drivers of deforestation, such as palm oil, soybean, beef, timber, and cocoa. Examples of VSSs operating in these commodity sectors include Fairtrade International, the Forest Stewardship Council (FSC), Indonesian Sustainable Palm Oil (ISPO), International Sustainability and Carbon Certification, the Malaysian Palm Oil Council, Organic, the Program for Endorsement of Forest Certification (PEFC), the ProTerra Certification Standard, the Rainforest Alliance, the Round Table for Responsible Soybean, and the Round Table for Sustainable Palm Oil.³⁶ Table A1 illustrates examples of criteria that some of these schemes cover.

³⁶ An analysis of the criteria coverage of most of these schemes with regard to forest conservation and deforestation prevention is available in Larrea et al. (2021).



Table A1. Examples of criteria coverage of a number of VSSs

Sustainability standards	Products	Deforestation prevention and reforestation		
		Ban on converting areas with high biodiversity, conservation value, or carbon stock (Cut-off date)	Restoring Natural Areas	Reforestation
Fairtrade	Cocoa	✓ (-)	○	—
RA	Cocoa, palm oil	✓ (2014)	✓	✓
Organic	Cocoa, palm oil, soy	✓ (5 years prior to certification)	✓	—
RSPO	Palm oil	✓ (2005)	✓	✓
ISCC	Palm oil, soy	✓ (2008)	✓	✓
RTRS	Soy	✓ (2009 & 2008 for the Amazon)	✓	—
ProTerra	Soy	✓ (2008)	✓	—
FSC	Timber	✓ (National standard)	✓ (National standard)	✓ (National standard)
PEFC	Timber	✓ (National standard)	✓ (National standard)	✓ (National standard)

Source: Larrea et al., 2021. Modified from de Koning & Wiegant, 2017 and updated based on information available in the ITC Standards Map (ITC, n.d.) on Fairtrade Small Producers Organizations standards, Rainforest Alliance, Organic, RSPO, RTRS, ProTerra, FSC and PEFC standards consulted on October 20, 2021. For updates on ISCC, the document consulted was *ISCC, 202: Sustainability Requirements* (ISCC, 2020).

Note: VSS design on deforestation prevention and reforestation: Alignment between deforestation prevention and reforestation practices and required (✓), recommended (○), or absent (—) production criteria of VSSs for cocoa, palm oil, soy, and timber.

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