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ESG GUIDE FOR FORESTRY INVESTMENTS

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CONTENTS

CONTENTS

CONTENTS

CONTENTS

List of Figures

List of Tables

CONTENTS

List of Boxes

CONTENTS

ACKNOWLEDGMENTS

This guide is the culmination of decades of experience of investing in forestry, particularly in tropical forest countries and emerging markets. The guide originated with FMO's Forestry ESG team, who had started to compile a library of key reference sources they used in conducting ESG due diligence of potential forestry investments. From this basis, the 'ESG Guide for Forestry Investments' was created by the experts of JSL Consulting Ltd, led by Jill Shankleman and supported by Emma Lear, Stu Valintine and Stephanie Bishop. Between them, they have over 80 years of experience in ESG analysis for forestry investments. We would like to acknowledge their hard work, flexibility and the incredible depth of knowledge, insight and creativity they have put into this guide.

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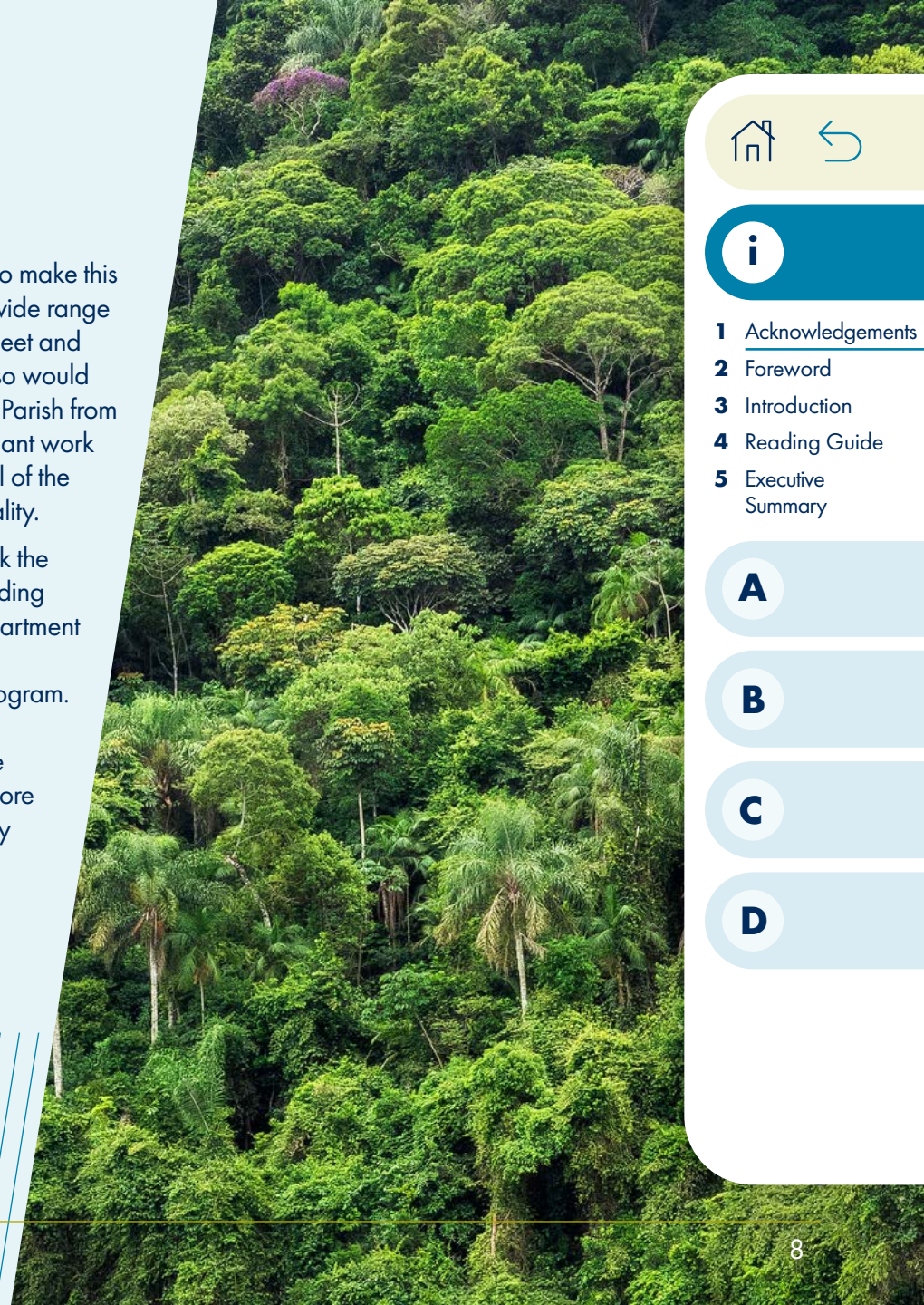


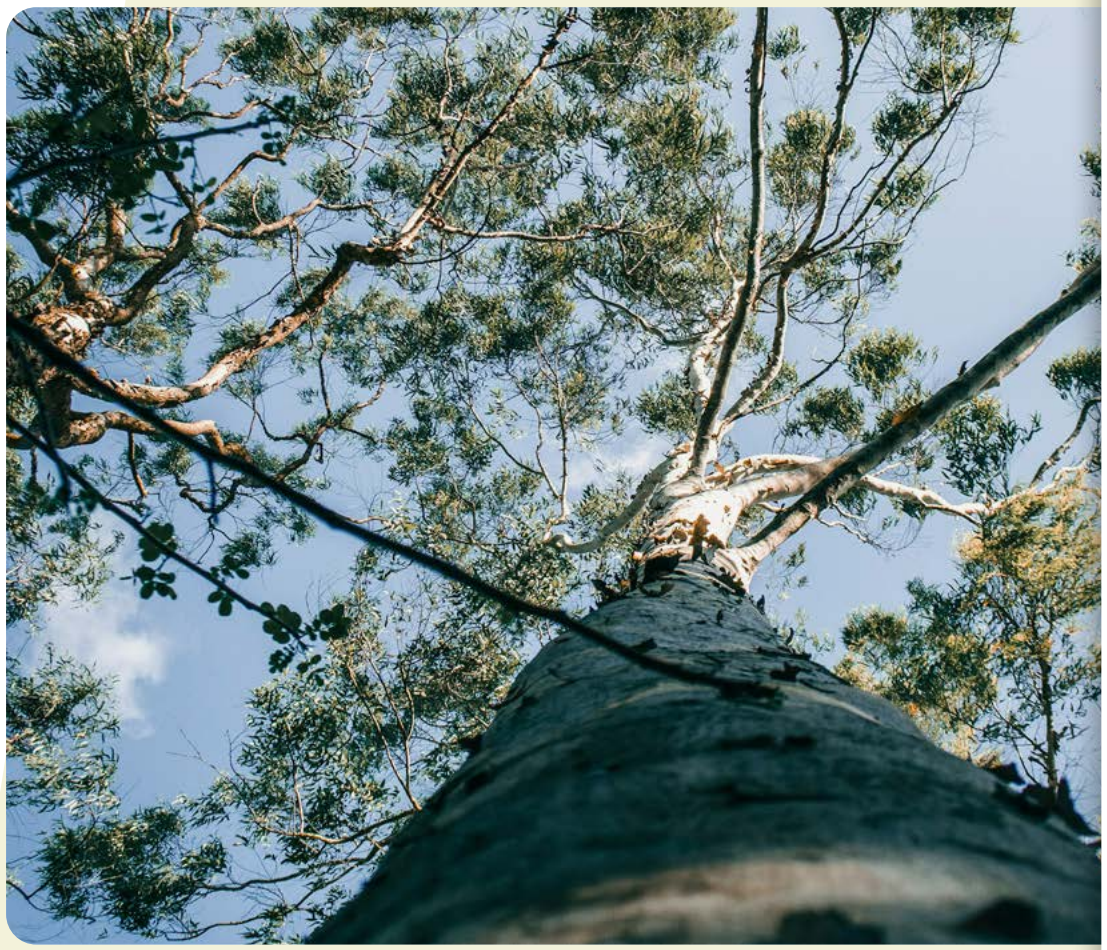
FOREWORD

ESG is an essential part of successful forestry investments. The approach to manage ESG risks and materialize the impact potential is complex, and requires addressing different considerations throughout the investment process.

This guide supports the understanding of such considerations by describing the relevant ESG matters in relation to the asset class characteristics. This is not a policy, but rather an overview of potentially applicable ESG considerations, supporting investors to keep on seeing the wood for the trees. It is meant to contribute to well-informed decision-making processes and indirectly to a responsible allocation of capital to sustainable forestry initiatives.

Commercial and operational performances are intertwined with the approach to embed forestry projects sustainably in their local environmental and social context. Environmental matters such as the geohydrological state of a catchment area, biodiversity trends at landscape level, or the quality and stability of soils are often directly linked to the design and operation of commercially productive and ecologically thriving forests. The interdependence of local communities with the forest' ecosystem services, as well as the socio-economic and institutional context including the availability of formal labour in remote areas, all may determine the way forests can be managed sustainably over the long term. As such, ESG management may be considered a core attribute of forestry management teams.

There are different ways to integrate ESG considerations in the investment process, and there is no one-size-fits-all approach. It will vary depending on the type of investment as well as specific local conditions, including the state of the environment and local social



Eucalyptus tree, Carlos Costa on Unsplash images.

FOREWORD

dynamics. Moreover, the forestry asset class has some characteristics that are particular to the sector and give rise to specific ESG considerations, including scale (spanning large areas of land), timescale (patient capital to facilitate biomass accumulation), diversity (natural resource management and processing, marketing, carbon credits, ecosystem services, nature conservation etc.), and dependence on certification (voluntary ESG performance certificates, incl. for carbon credits) and supply chain regulations (e.g. the EUDR). This calls for an integrated approach to ESG together with active monitoring to facilitate adaptive management approaches.

The above applies to both risks and impact management. The latter includes opportunities for climate mitigation, through carbon sequestration and carbon storage in wood products (possibly replacing carbon intensive materials such as steel, concrete or plastics), or emission avoidance e.g. through protection of existing forests, through supply of deforestation free timber, or through adequate wildfire control protecting standing forests. It also covers climate adaptation benefits e.g. through improved land management

> There are different ways to integrate ESG considerations in the investment process, and there is no one-size-fits-all approach

and stabilizing microclimates, as well as biodiversity benefits when interventions support the regeneration, conservation and protection of natural areas. Simultaneously social benefits may be materialized e.g. through the creation of employment opportunities and contributions to the development of local infrastructure and the local economy. However, increasing forest cover to achieve these positive impacts is not straightforward and claiming impact calls for diligent ESG approaches; the possible building blocks for which are covered in this guide.

Forests and their understory may appear green in colour, but they may not be beneficial from a sustainability perspective if not well-managed with due consideration to ESG performances. A growing amount of capital is being allocated to this asset class, and more is needed specifically for emerging markets to ensure long-term supply of sustainable wood to the market to meet the growing demand, whilst also positively contributing to climate, biodiversity and soil degradation challenges. Simultaneously, different market instruments are emerging such as carbon or biodiversity credit mechanisms, whilst supply chain regulations are being strengthened at different levels. Investing into the forestry space is thus a dynamic and highly demanding endeavour, and ESG management is being widely acknowledged for its pivotal role. This guide builds on years of experiences and offers investors insights into possible considerations, which can help to have the right discussions at the right time. That way, forestry investments can be successful for all stakeholders, including local communities and our one and only planet earth.

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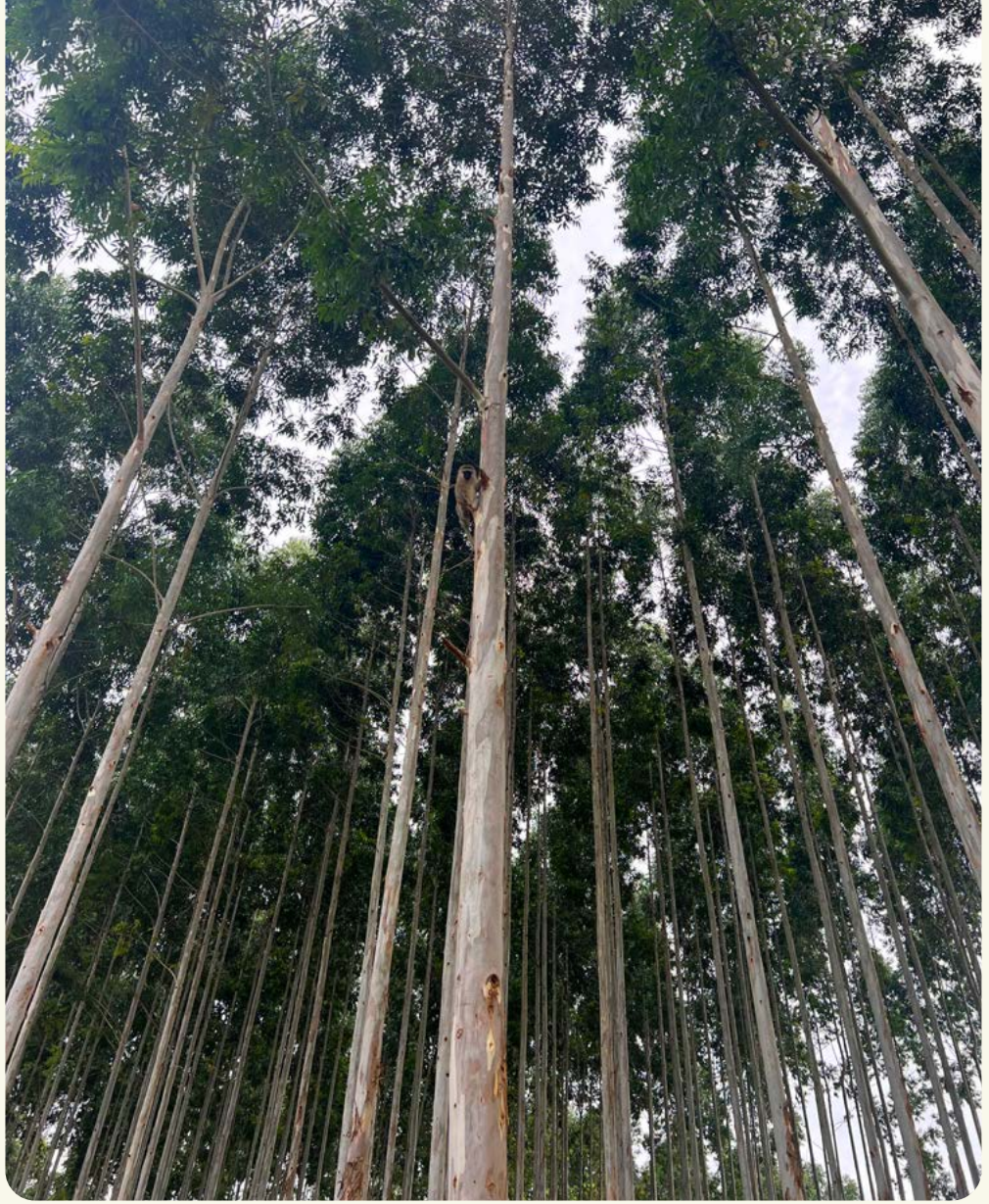
INTRODUCTION

Mobilising Finance for Forests (MFF) was established in 2021 by the United Kingdom government and FMO as a blended finance investment programme to combat deforestation and other environmentally unsustainable land use practices contributing to global climate change. The programme aims to accelerate private investments in the forestry and sustainable land use sectors, using a blended finance investment approach in tropical forest regions that are contributing to global climate change. This guide has been developed as part of the MFF commitment to developing and disseminating learning products relevant to its mission.

Development Finance Institutions (DFIs) and other investors are seeking to increase investments in the forestry sector in low- and middle-income countries (LMICs), often as part of their climate action strategies. Investments in forestry for wood production and in forest-based projects for climate mitigation and adaptation purposes, ecosystem regeneration and protection of biodiversity, the generation of carbon credits through schemes such as REDD+ [1] or the production of non-timber forest products (NTFPs), bring environmental, social and governance (ESG) risks, alongside the attractive impact opportunities. Many of these risk areas are specific to the sector in LMICs.

The primary aim of the guide is to support investors, particularly the officers responsible for identifying, assessing and managing environmental and social risks and impacts, by providing an operational reference manual that focusses on the critical elements that an investor needs to



[1] REDD+ is a programme developed through the United Nations designed to reduce emissions from deforestation and forest degradation in developing countries. A key element relevant to investors is that it enables tradeable carbon credits to be generated from approved projects that reduce deforestation and forest degradation.

INTRODUCTION

know about forestry projects and what investigations they need to conduct on the project in order to make informed investment decisions. It is designed primarily for ESG Officers and draws from ESG Officer experience, expertise and best practices. A further key audience is investment officers (commercial, legal and technical) given the strong links between robust ESG management and the business case for all nature-based solutions. Additional audiences include a wider set of users from the forestry, carbon credits, NGO and investor sectors. The Guide assumes that users start with knowledge of key international social and environmental standards, specifically the IFC Social and Environmental Performance Standards and the World Bank Environmental Health and Safety Guidelines.

Part A presents contextual information on the wood-based and carbon forestry sectors, including types of forest, rates of change, technical and commercial characteristics of the sector. **Part B addresses ESG considerations** for investors, focusing on aspects that are specific to the sector, including sustainability certification systems that play an important role and impact opportunities. **Part C outlines the investment life cycle** including forest sector-specific approaches in investment selection, contracting, monitoring and exit. Annexes provide detailed tables with additional information.

While the guide focusses on investments in the wood production and forest-based carbon credits sector, the information in the guide may also be relevant to related sectors such as tree crop production, e.g. nuts, cacao.

The guide is intended to provide information to support investors to make decisions related to risks and impacts, recognising that each investor has its own objectives and risk appetite.

The programme aims to accelerate private investments in the forestry and sustainable land use sectors

READING GUIDE

4.1 List of Acronyms

ACR	American Carbon Registry
AFOLU	Agriculture, Forestry and Other Land Use
AI	Artificial Intelligence
AoI	Area of Influence
ARR	Afforestation, Reforestation, Restoration
ART	Architecture for REDD+ Transactions
ASI	Accreditation Services International
BII	British International Investment
CAO	Compliance Advisor Ombudsman
CAR	Corrective Action Requests
CB	Certification Body
CCA	Chromium Copper Arsenate
CCB	Climate, Community and Biodiversity
CCP	Core Carbon Principles (of the ICVCM)
CS	Conditions Subsequent
CSO	Civil Society Organization
CE	Conformité Européenne
CH	Critical Habitat
CITES	Convention on the International Trade in Endangered Species
CoC	Chain of Custody (FSC)
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CP	Conditions Precedent
CPR	Construction Products Regulation
CS	Conditions Subsequent
CSO	Civil Society Organization
DFI	Development Finance Institution
E&S	Environmental and Social
EDF	Environmental Defense Fund
eDNA	Environmental Deoxyribonucleic Acid
EHS	Environmental Health and Safety
ESAP	Environmental and Social Action Plan
ESG	Environmental, Social and Governance
ESIA	Environmental and Social Impact Assessment
ESMS	Environmental and Social Management System
ETA	European Technical Approval
ETS	Emissions Trading Scheme
EU	European Union
EUDR	European Union Deforestation Regulation
FAO	Food and Agriculture Organization
FM	Forest Stewardship Standard (FSC)
FM CW	Forest Controlled Wood Standard (FSC)
FMU	Forest Management Unit
FPIC	Free, Prior and Informed Consent
FRA	Forest Resources Assessment
FSC	Forest Stewardship Council
GBVH	Gender-Based Violence and Harassment

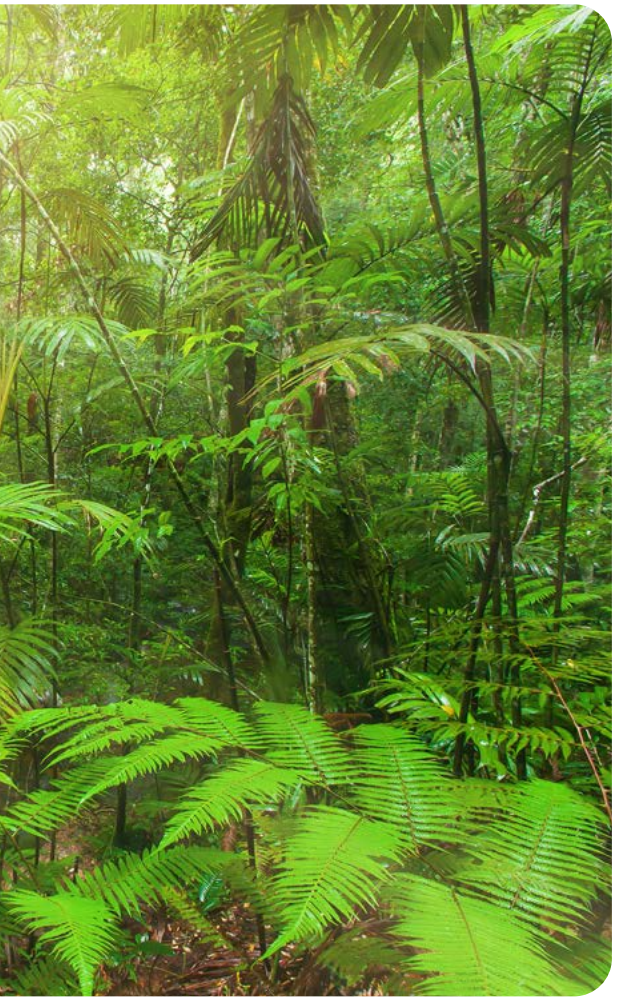
READING GUIDE

GHG	Greenhouse Gases
GIIN	Global Impact Investing Network
GPS	Global Positioning System
GRI	Global Reporting Initiative
GS	Gold Standard
GS4GG	Gold Standard for the Global Goals
GWP	Global Warming Potential
HCS	High Carbon Stock
HCV	High Conservation Value
hEN	Harmonized European Standard
HFLD	High Forest Low Deforestation
HR	Human Resources
HWC	Human-Wildlife Conflict
ICAO	International Civil Aviation Organization
ICP	Informed Consultation and Participation
ICVCM	The Integrity Council for the Voluntary Carbon Market
IFC	International Finance Corporation
IFC PS	IFC Social and Environmental Performance Standards
IFL	Intact Forest Landscapes
IFM	Improved Forest Management
ILO	International Labor Organization
IPM	Integrated Pest Management
IRA	Internationally Recognized Area
IRC	Internal Revenue Commission
IRW	Industrial Roundwood
ISO	International Organization for Standardisation
ITTO	International Tropical Timber Organization
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
KPI	Key Performance Indicator
KVTC	Kilombero Valley Teak Company
KYC	Know Your Client
LCIP	Learning, Convening and Influencing Platform of MFF
LIDAR	Light Detecting and Ranging
LMIC	Low- and Middle- Income Country
LTIFR	Lost Time Injury Frequency Rate
LULUCF	Land Use, Land Use Change and Forestry
M&E	Monitoring and Evaluation
MFF	Mobilising Finance for Forests
MIGA	Multilateral Investment Guarantee Agency
NbS	Nature-based Solution
NFSS	National Forest Stewardship Standards
NGO	Non-Governmental Organization
NH	Natural Habitat
NNL	No net loss
NPI	Net positive impacts
NTFP	Non-Timber Forest Products
OCHCR	Office of the United Nations High Commissioner for Human Rights

READING GUIDE

OECD	Organization for Economic Co-operation and Development
OHS	Occupational Health and Safety
OSB	Oriented Strand Board
PA	Protected Area
PDD	Project Design Documents
PEFC	Programme for the Endorsement of Forestry Certification
PES	Payment for Environmental Services
PNG	Papua New Guinea
PVA	Polyvinyl Acetate
REDD+	Reducing Emissions through Deforestation and forest Degradation
RFID	Radio Frequency Identification
RIL	Reduced Impact Logging
RSPO	Roundtable on Sustainable Palm Oil
RWE	Roundwood Equivalent
SAR	Synthetic Aperture Radar
SBTi	The Science Based Targets initiative
SBTN	The Science Based Target Network
SD VISta	Sustainable Development Verified Impact Standard
SDG	Sustainable Development Goal
SFM	Sustainable Forest Management
SME	Small or Medium Enterprise
SOP	Standard Operating Procedure
SPOTT	The Sustainable Palm Oil Transparency Toolkit
STAR	Species Threat Abatement and Restoration
TA	Technical Assistance
TREES	The REDD+ Environmental Excellence Standard
UDEFEGUA	Unidad de Protección a defensoras y defensores de Derechos Humanos de Guatemala
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
USA	United States of America
USAID	The United States Agency for International Development
USD	United States Dollars
VCS	Verified Carbon Standard
VCU	Verified Carbon Unit
VCMI	Voluntary Carbon Market Integrity Initiative
VER	Verified Emission Reduction
VGGT	Voluntary Guidelines on the Responsible Governance of Tenure of land, fisheries and forests
VPs	Voluntary Principles on Security and Human Rights
WHO	World Health Organization
WRC	Wetlands Restoration and Conservation
WRI	World Resources Institute
WWF	World Wildlife Fund

READING GUIDE



4.2 Glossary

Carbon credit – A carbon credit represents either the permanent removal of one tonne of CO2e from the atmosphere or the avoidance of emissions equating to one tonne of CO2e. The carbon credits verified under VCS are called Verified Carbon Units (VCUs). Carbon credits can also be referred to as Verified Emissions Reductions (VERs). Gold Standard uses either carbon credits or VERs.

(Voluntary) Carbon credit registries – There are several registries in the voluntary carbon credit market, which have been developed by governments, non-profits, and the private sector. Carbon registries play a critical role in ensuring the integrity of the voluntary carbon market, as they track the ownership, issuance, retirement, and transfer of carbon credits. Examples of registries are Gold Standard (GS), Verra (VCS), American Carbon Registry (ACR), Climate Action Reserve etc.

Carbon credit principles – Organizational bodies like the Integrity Council for the Voluntary Carbon Market (ICVCM) are setting global benchmarks for carbon credits and offsets. These include the Core Carbon Principles (CCPs) aiming to set new standards for high-quality credits and bring CCP-eligible guidelines to the market.

Carbon credit validation and verification bodies – All carbon credit projects are subject to validation of projects and verification of mitigations. Carbon offset verification involves a rigorous inspection and approval process by a third-party validation/verification body ensuring the project meets the standards accepted by the carbon market including conformity with the standards of the respective registry, e.g., being additional and permanent.

Conservation – The protection and, in some cases, enhancement of natural ecosystems with the aim of protecting species and ecosystems, and the services they provide.

Critical Habitat – Critical habitats are areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered11 species; (ii) habitat of significant importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes. (IFC PS-6)

Forest – An area with a high density of trees (UNREDD). There are different types of forest distinguished by climatic zone and status, e.g. natural forests and forest plantations. Refer to Part-A, Section 6.1.1 on 'definition of forests' for more detail and a comparison of definitions.

The FAO-FRA defines forest as land over 0.5 ha with trees >5m in height and >10% canopy cover, or trees able to reach these thresholds in situ. It excludes land predominantly under agricultural or urban land use. EUROSTAT and Forest

READING GUIDE

Europe apply the same definition. Note that national definitions may differ from FAO. The trees should be able to reach a minimum height of 5 meters at maturity in situ. This excludes land primarily under urban or agricultural use.

Forest carbon – Forest carbon is carbon that has been sequestered from the atmosphere and is now stored within the forest ecosystem, mainly in above and below-ground biomass and soils.

Forestry/Forestry Sector – the planning and implementation of managing a forest, whether natural or plantation. This could be for conservation purposes (including production of carbon credits), or to produce products such as timber, or a combination of the two.

Forest Sector – projects focusing on the production and processing of trees for timber and related products.

High Conservation Value (HCV) – HCVs are any of the following six values: species diversity, landscape-level ecosystems and mosaics, ecosystems and habitats, critical ecosystem services, community needs, and cultural values. These are described in further detail in the HCV section of this document.

Local people/communities – The term local people describes the broad group of people living in or near a forest, with some significant level of dependence upon it. The term includes forest dwellers, indigenous forest-adjacent populations, and recent immigrants (IFC).

Indigenous Peoples – Indigenous Peoples are inheritors and practitioners of unique cultures and ways of relating to people and the environment. They have retained social, cultural, economic and political characteristics that are distinct from those of the dominant societies in which they live (UN Department of Economic and Social Affairs). Depending on the jurisdiction, they may or may not be legally recognized as Indigenous.

Natural Forest – A forest area with many of the principal characteristics and key elements of native ecosystems, such as complexity, structure, and biological diversity, including soil characteristics, flora and fauna, in which all or almost all the trees are native species, not classified as plantations. It may be managed to produce timber, non-timber forest products, and/or carbon (FSC).

IFC defines a natural forest as an area in which the cover has evolved naturally so as to provide significant economic and/or ecological benefits, or one that is sufficiently advanced in regeneration and recovery from disturbance as to be judged in near-natural condition. The World Bank Group EHS Guidelines for forest harvesting operations in natural forests apply to forests where the principal characteristics of natural forest ecosystems (e.g. complexity, structure, and diversity) are present.

Refer to Part-A, Section 6.1.1 on 'definition of forests' for more detail and a comparison of definitions.

Natural habitat – Natural habitats are areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition (IFC).

Non-native – A species, subspecies or lower taxon, introduced outside its natural past or present distribution. It may also be called an alien species or an exotic species. (FSC)

Modified habitat – Modified habitats are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition. Modified habitats may include areas managed for agriculture, forest plantations, reclaimed coastal zones, and reclaimed wetlands (IFC).

Plantation – A forest area established by planting or sowing using alien and/or native species, regular spacing, and even age classes that are intensively managed and which lacks most of the principal

READING GUIDE

characteristics and key elements of natural forests. As per the World Bank Group EHS Guidelines for forest harvesting operations, most of the principal characteristics of natural forest ecosystems (complexity, structure, diversity) are not present in plantations.

Refer to Part-A, Section 6.1.1 on 'definition of forests' for more detail and a comparison of definitions.

Primary (or Pristine) forest – a sub-set of natural forest where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed (FAO). IFC defines primary forest as relatively intact forest that has been essentially unmodified by human activity for the previous 60 to 80 years.

Salvage (or Sanitation) Logging – is a harvest of trees in forest stands that have been destroyed or damaged by wind, fires, pests and other natural disturbances to improve forest health. (FSC)

Sustainable Forest Management (SFM) or Responsible Forest Management – The aim of sustainable forest management (SFM) is to ensure that forests supply goods and services to meet both present-day and future needs and contribute to the sustainable development of communities (FAO). According to the Helsinki[2] resolution, SFM is "the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems." The United Nations General Assembly in 2007 recognizes SFM as a dynamic and evolving concept that aims to maintain and enhance the economic, social and environmental values of all types of forests for the benefit of present and future generations, considering the following seven thematic elements as a reference framework: (1) extent of forest resources; (2) forest biodiversity; (3) forest health and vitality; (4) productive functions of forest resources; (5) protective functions of forest resources; (6) socio-economic functions of forests; and (7) legal, policy and institutional framework.

Refer to Part-A, Section 7.3 on 'sustainable forest management' for a more elaborate introduction of the concept.

Sustainable natural forest management (SNFM) – Sustainable management of natural forests means controlled utilization of the resource to produce wood and non-wood benefits into perpetuity, with the basic objectives of long-term maintenance of forest cover and appropriate reservation of areas for biodiversity protection and other ecological purposes (IFC).

Timber – For the purposes of this guidance, timber encompasses forest products produced commercially including sawn logs, pulp and paper, biomass for energy production, but not final products such as furniture. This does not include products generally considered to be non-timber forest products such as fruits, nuts or parts of trees or other plants used for medicinal reasons.

Voluntary Certification – Voluntary certifications are certification systems that organizations can choose to pursue in order to demonstrate, generally through third-party verification, that they follow standards (generally) higher than those mandated by law.

[2] The General Declaration and the four Helsinki Resolutions reflect Europe's approaches to global environmental issues, incl. the promotion of sustainable forest management, the conservation of biological diversity, strategies regarding the consequences of possible climate change for the forest sector, and increasing cooperation with countries in transition to market economies.

EXECUTIVE SUMMARY

Introduction

This guide has been developed under the Mobilising Finance for Forests (MFF) programme.[3] In the context of growing demand for wood and the acceleration of forest-based carbon credit programmes, the guide sets out environmental, social and governance considerations relevant to impact investors seeking to advance climate and biodiversity goals by lending to, or investing in, forest sector projects in low and middle-income countries. The guide is intended to provide information to support investors make decisions related to risks and impacts, recognising that each investor has its own objectives and risk appetite.

Scope

The guide focusses on emerging markets and investments in two asset classes: wood production and primary processing, and forest-based carbon credits. Information in the guide may also be relevant to the pulp and paper sector, agroforestry and production of non-timber forest products.

Forests

Forests include both naturally regenerating and planted forest, and account for 31% of the world's land area. Over 90% of the global forest area comprises naturally regenerating trees, about a quarter of which is primary forest (minimally influenced by human activity). Plantations for wood production account for 3%. The world's total forest area continues to decline even though the rate of decline has eased since 1990 due to a reduction in deforestation in some areas plus an increase in forest area in others through tree planting (in Latin America the rate of forest loss is declining, and Asia saw a net gain in forest area) [1].

Investment needs

FAO report that up to 2050, investment of $USD 320bn a year is needed for conservation and rehabilitation of tropical and sub-tropical forest in emerging markets, to meet global climate, biodiversity and land degradation targets [2]. This will bring substantial global environmental benefits but make a limited contribution to global timber production. An annual investment of $USD16 bn is needed to increase production from planted forests by increasing the planted area and improved management. 30% of internationally traded roundwood and sawnwood is produced in Africa, Oceania and Asia [3]. Plantations in emerging markets are expected to make a growing contribution to the global extent of planted forest. Further investments in wood processing to increase capacity and modernize equipment and installations are estimated at $USD25bn a year.

A key factor in evaluating investment opportunities related to the establishment of new forests is checking that site-species matching is robust and the forest design and management system has the potential to achieve positive environmental and commercial

[3] Mobilising Finance for Forests (MFF) uses a blended finance investment approach to combat deforestation and other environmentally unsustainable land use practices in tropical forest regions that are contributing to global climate change. MFF is funded by the UK Department for Business, Energy and Industrial Strategy and implemented by FMO, the Entrepreneurial Development Bank. As part of the MFF program, the Palladium Group has been contracted to deliver a 'learning, convening and influencing platform' (LCIP). FMO and Palladium contributed to the guidance alongside specialist consultants.

EXECUTIVE SUMMARY


Indigenous replanting in the foreground, eucalyptus stand in the background.

impacts without damaging local livelihoods, e.g. through restrictions on access to resources.

The impact case for investing in forest sector projects

The impact case for investing in the forest sector is the potential to contribute to climate change mitigation and adaptation by sequestering carbon and leading to more resilient areas as well as contributing to other sustainability goals including protection and enhancement of biodiversity; economic growth and employment opportunities; poverty reduction and water management. There is scope to enhance opportunities for women in a sector in which they are typically under-represented. Achieving positive impacts depends on how projects are designed and implemented. Best practices are to design-in potential for positive impacts, for example, through deploying sustainable forest management practices; establishing a pre-project baseline and setting up monitoring protocols from the start. As with ESG risks, adaptive management is needed as new information becomes available once the project is implemented.

Key forest sector products and supply chains

Key internationally traded wood and primary wood products are logs, sawnwood, veneer and ply. Logs make up the largest volume of tropical wood production; the greatest dollar value is in exported veneer, and highest unit value, plywood. Projects may also target supplying poles for the domestic electrification market. Wood for all uses can be sourced from naturally regenerating forests or planted forest [4]. Pulp is produced from dedicated plantations and from offcuts from timber plantations. Globally most is produced in advanced economies but production is expanding in emerging markets where Brazil is already a leading producer.

Key traded forest carbon products are credits for avoided deforestation (REDD+) and for carbon sequestration through afforestation, reforestation, restoration (ARR); soil sequestration, biochar production and wetland restoration. Carbon credits are an emerging market. The limited available data suggests that the total value of the voluntary carbon market is just under $2bn [5], and credits from ARR activities are generally higher priced than others in the forest carbon sector as buyers value credits that reflect the removal of carbon from the atmosphere over those that are generated through the reduction or avoidance of emissions. Significant initiatives are underway to raise quality in the sector, e.g. the Integrity Council for

EXECUTIVE SUMMARY

the Voluntary Carbon Market's (ICVCM) Core Carbon Principles that rates carbon credit generating programmes and the Voluntary Carbon Market Integrity Initiative's (VCMI) Claims Code of Practice that sets out best practice for buyers of carbon credits.

Projects in the forest sector may comprise only one activity or several different elements such as forest protection, plantation, wood processing and generation of carbon credits. Key project characteristics may change during the project lifetime, e.g. change in the species planted if productivity does not meet expectations or market conditions change, or a changed processing plan, e.g. from poles to ply, if markets change by the time the processing plant is constructed. The possibility of such change requires investors to consider how this will be addressed in contracts where, for example, additional due diligence is needed or financial models changed.

Key characteristics of forest sector projects

Specific characteristics of forest sector projects important to assessing, contracting and monitoring impact investments are scale; time to maturity; diversity; the important role of voluntary certification and international regulation of supply chains.

- **Scale** – plantations, harvesting from naturally regenerating forest and forest carbon projects tend to cover very large areas of land, frequently in the tens of thousands of hectares, and in remote locations. This makes the collection of baseline data and analysis of impacts complex; projects may have many, diverse community and local government or forest authority stakeholders, and face challenges with respect to remote working and emergency response. Over large areas of land, it can be difficult and time-consuming to identify which parts are suitable (technically, environmentally and socially) for different activities such as conservation or new planting. For example, determining if reforestation is environmentally appropriate for degraded pasture; understanding where and how local communities use land for their livelihoods and income, and fully documenting land ownership for which there may be overlapping claims. Projects may have landscape-level impacts that are complex to understand and not wholly within the control of a project to manage.
- **Timescale** – forests take longer to grow than most agricultural crops. Forest carbon projects based on afforestation/reforestation also take several years to produce marketable carbon credits, although revenue may flow earlier if credits are pre-sold. A long period to profitability can put pressure on ESG budgets, slow delivery of environmental and social commitments and mean that positive impacts are not realized within the tenor of an investment. In the forest sector it is particularly important that ESG budgets and resourcing are hard-wired into project financial models, and impact metrics track progress as well as outcomes.
- **Diversity** – forest sector projects range from the relatively simple (e.g. logging and sale for further processing) to those having multiple components including large-scale and smallholder plantations, conservation areas, carbon credits, ecosystem services, and wood processing. From an ESG and impact perspective, it is key for investors to identify all the project components and how these will be assessed and managed across the period of project execution, e.g. construction of processing facilities once a plantation is established.

EXECUTIVE SUMMARY


Image courtesy of Partnerships for Forests

- **Certification** – the forest sector is unusual in the important role that voluntary certifications play in establishing ESG standards and in the marketplace. The Forest Stewardship Council (FSC) [6] and the Programme for the Endorsement of Forest Certification (PEFC) [6] operate voluntary certification schemes for wood and wood products based on the concept of sustainable forest management. FSC and PEFC certification is widely recognized in the market: producers of end-use wood products may require their supply chain from wood production upwards to be certified. With respect to forest carbon, marketable carbon credits are issued by standards bodies. The Voluntary Carbon Standard (VCS), Climate Community and Biodiversity Standards (CCB)[4] and Gold Standard[5] are internationally recognized certification standards in the voluntary carbon market. (Carbon credits can be controversial: the Integrity Council for the Voluntary Carbon Market [8] has established a 'high-integrity' benchmark against which it is assessing carbon credit programmes.) The ESG requirements of certification standards overlap with, but are not identical to, the IFC Social and Environmental Performance Standards, and the detailed requirements for certification change more frequently than IFC standards; FSC and PEFC also provide for some national variation.
- **Supply chain regulations to prevent deforestation** – under the new EU Regulation on Deforestation Free Products (EUDR) [9][6] controls will be applied to wood and wood products on the EU market from 30 December 2024. EUDR sets mandatory due diligence rules for businesses that place wood and wood products on the EU market, or export them from the EU, to demonstrate that products are legal, deforestation-free and degradation-free. Operators are required to trace the commodities they sell back to the plot of land where they were produced. Similar, but not identical, regulations have been proposed in the USA [10] and under a China-Brazil pact [11]. Wood and wood product certification programmes are developing additional modules to align with EUDR, including providing the necessary geo-location coordinates. Consultancies and certification providers offer 'regulatory certification' services to assist forestry sector companies to comply.

ESG risks

As well as potential to generate positive impacts, forest sector projects present ESG risks that successful projects need to identify and manage. Many ESG considerations are like those found in large projects in other sectors such as agriculture or infrastructure, where projects require a comprehensive social and environmental baseline and impact assessment and an environmental and social management system that addresses the projects' regulatory requirements, risks and opportunities and ensures that sufficient human and budgetary resources are in place, including ESG specialists. Forest sector projects in emerging markets are often in remote locations and present potential risks to Indigenous Communities,

[4] VCS and CCB standards are managed by Verra.
[5] The Gold Standard is managed by The Gold Standard Foundation.
[6] Note that the EU will publish a list of high-risk areas requiring enhanced due diligence and detailed guidance on implementing the regulation.

EXECUTIVE SUMMARY

areas of high conservation value, livelihoods of downstream communities, as well as altering the overall landscape. Remote, large locations also make it challenging to ensure good standards of worker accommodation and welfare and provide project security consistent with international human rights standards. Forests are at risk of fire – naturally or human-induced. Contractors are widely used for all aspects of forest management which requires oversight by projects. These aspects, and issues of labor and working conditions; pollution control and resource efficiency; community health safety and security; land acquisition, and potential impacts on Indigenous People and cultural heritage can largely be identified and addressed through application of international standards, notably the IFC Social and Environmental Performance Standards [12] and related materials [13] [14].

ESG in the investment process

The success of forest sector projects - commercially and in delivering positive impacts- depends substantially on excellent ESG performance. ESG and impact considerations for the investment process include the following:

- **Initial screening** for 'red flags' – factors such as proposed activities on Indigenous Peoples' lands; absence of baseline data, e.g. on biodiversity, land ownership and land rights; activities in conflict areas; weak project governance structures or complex legal structures to circumvent restrictions on land ownership or leasing which can make a project 'no go' or mean that detailed and time-consuming studies are needed before the project can be fully evaluated.
- **Due diligence** – including understanding the timeline for project activities; reviewing (and potentially requiring enhancement of) the impact assessment to ensure it covers all aspects of national legislation and international standards; visiting the site(s) to reality-check project description and meet key local stakeholders; evaluating the ESG experience and skills of the team implementing the project; and negotiating with the project developer/client the ESG conditions that apply to the investment. At this stage the investor may commission, or require the client to commission, studies or consultations, for example on hydrology and water availability; biodiversity; status of local support and free, prior and informed consent. Depending on the investor and the project, technical assistance may be available to support studies and consultations. Except in the rare case where a project has prepared all necessary documentation and consultations, due diligence is likely to be a lengthy process. Due diligence concludes with an investment proposal that includes identification and assessment of ESG risks and impact potential; management measures to reduce risks and enhance impact potential, and specific contractual requirements and monitoring and evaluation processes required by the investor. In some cases, it ends with a decision by the investor not to pursue the opportunity for ESG, impact or commercial reasons.
- **Contracting** includes ensuring that the investor's ESG and impact requirements are included in the investment contract. Typically, this includes warranties to comply with the investor's ESG policy; requirements for reporting violations or serious ESG incidents; conditions precedent (CPs) for investment or disbursement; an Environmental and Social Action Plan (ESAP) defining specific actions to enhance ESG performance, with definition of deliverables and timing; and periodic (often annual) ESG and impact reporting requirements, including the obligation on the project to undertake corrective actions/adaptive management where identified in monitoring.

EXECUTIVE SUMMARY

- **Monitoring** includes desk-based and site-based monitoring by the investor, with definition of who pays; what internal reporting is undertaken by the investor, and what information will be disclosed publicly. Defining ESG monitoring parameters and methodologies can be complex and require detailed site-specific studies.
- **Exit** – consideration is needed from the start about how high social and environmental standards and risk management can be embedded in a project so that they are maintained when an investor exits. Certification provides some comfort because this involves regular independent auditing; particular consideration is needed to ensure that conservation areas are maintained as such.

Forest sector certification and the IFC Environmental and Social Performance Standards

Much national legislation, and the key forest sector certification standards, has gaps or differences with respect to the IFC Social and Environmental Performance Standards. Key points include:

- **PS1 Assessment and Management of Environmental and Social Risks and Impacts** – gaps in the scope of impact assessment (e.g. contextual risks) and requirements for an Environmental and Social Management System (ESMS), including the engagement of disadvantaged or vulnerable people, a grievance redress mechanism, and an emergency preparedness and response plan.
- **PS2 Labor and Working Conditions** – gaps relating to protections for non-employed workers such as contractors and casual labor or migrant workers, documented information (e.g. contracts), a worker grievance mechanism, retrenchment (mass layoffs) plan, and worker training programs.
- **PS3 Resource Efficiency and Pollution Prevention** – gaps regarding resource efficiency; differences regarding control of chemicals, and explicit mentioning of greenhouse gas emissions and climate change.
- **PS4 Community Health, Safety and Security** – gaps in all aspects, including emergency preparedness and response, and security management.
- **PS5 Land Acquisition and Involuntary Resettlement** – IFC requirements are more detailed and include economic as well as physical resettlement.
- **PS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources** – important differences between the HCV assessment approach used in certification standards and the critical habitat approach in PS6.
- **PS7 Indigenous Peoples** – differences in definitions, eligibility for compensation, and detailed requirements for an Indigenous Peoples plan and the free prior and informed consent (FPIC) processes.
- **PS 8 Cultural Heritage** – wider scope of PS8.

EXECUTIVE SUMMARY

Governance

Key governance issues for investors in the sector to consider, in addition to aspects relevant to all investments such as Know Your Customer (KYC), include:

- **Carbon Integrity** – in addition to supply-side integrity, questions of demand-side integrity can be important. Who are credits sold to, and could this constitute 'greenwashing' if buyers use credits to avoid taking direct action to reduce emissions?
- **Fraud** – the international wood sector is highlighted by Interpol as vulnerable to fraud where wood is sold illegally because it has been harvested from prohibited species, outside permitted areas or labelled fraudulently. Requirements for traceability should reduce these risks, but it remains a significant problem with international crimes accounting for 15-30 per cent of all timber traded globally [15].
- **Board composition** – because of the importance of ESG risks, consideration should be given to whether the boards of companies developing forest sector projects include sufficient ESG and country-specific experience and how the investor will monitor and influence board performance during the long timespan between project inception and steady-state operations.

Structure of the guidance document

The Guidance document includes links and references to further information on impact, ESG risk management and the overall context for investors in forestry and forest carbon projects in emerging markets.

- Part A provides contextual information on the sector; outlines the key impact opportunities and the concept of sustainable forest management.
- Part B focusses on ESG: the aspects of forest sector projects that present ESG challenges different to large-scale projects in other sectors; voluntary certifications for wood/wood products and forest carbon; corporate governance considerations specific to the sector,
- Part C provides guidance on key issues to address in the investment process for forest sector projects.
- The Glossary defines terms and Annexes provide additional technical detail.

Eucalyptus in Tanzania

MFF
managed by FMO

PART A
FOREST SECTOR CONTEXT

This part of the guidance provides context relevant to investments in the forest sector. It covers:

- *Background on forests and the role they play both in terms of the environment and commercially*
- *Information on what is involved in managing forest projects for wood and for carbon*
- *Commercial considerations.*

OVERVIEW OF FORESTS

6.1 Types of forests and trees

6.1.1 Definitions of forests

There is no single definition of what constitutes a forest. FAO and the main systems of certifying wood (FSC and PEFC) use similar but not identical definitions and terminology. While there are variations, common points to note are that 'natural' forest does not mean 'untouched', plantations are considered to be forests, and it is possible for plantations to become 'natural' forests over time.

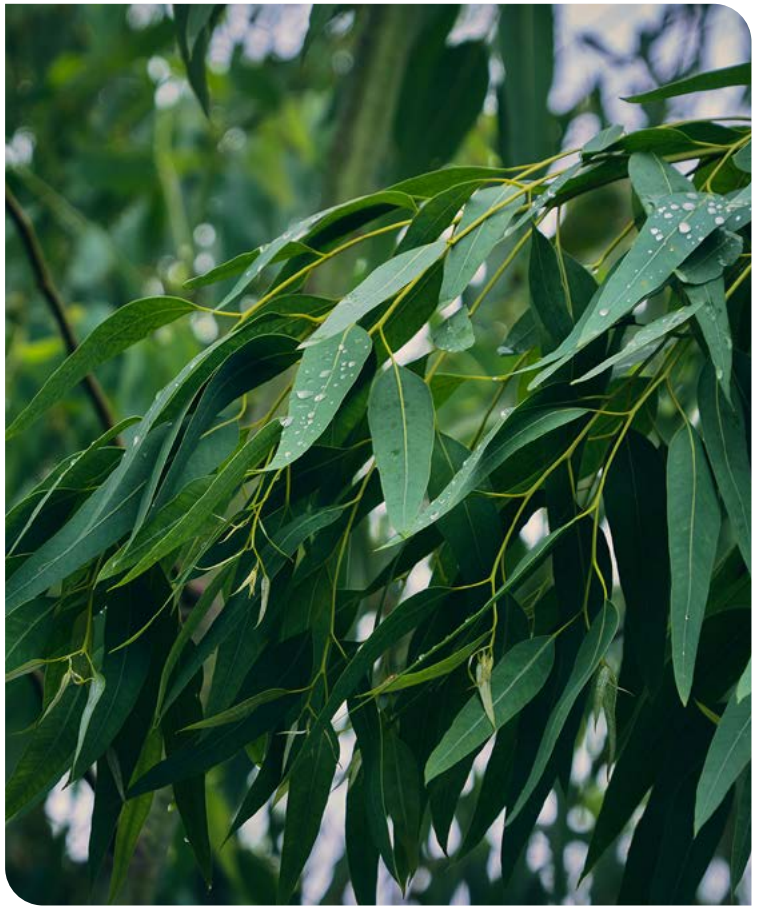
Table A1: FAO Definitions of forest [16]

Forest	A tract of land dominated by trees.
Primary forest	A territory which contains forest and non-forest ecosystems minimally influenced by human economic activity, with an area of at least 500 km2 (50,000 ha) and a minimal width of 10 km.
Naturally regenerating forest	• Forest affected by harvesting or other disturbances, in which trees are being or have been regenerated by a combination of natural and artificial regeneration with species typical of natural forests in that site. • Natural forests which are maintained by traditional silvicultural practices including natural or assisted natural regeneration. • Well-developed secondary or colonizing forest of native species which has regenerated in non-forest areas. • 'Natural forest' may include areas described as wooded ecosystems, woodland and savanna. • Areas which would initially have complied with the definition of 'plantation' but which, after the passage of years, contain many or most of the principal characteristics and key elements of native ecosystems, may be classified as natural forests. • Plantations managed to restore and enhance biological and habitat diversity, structural complexity and ecosystem functionality may, after the passage of years, be classified as natural forests.
Plantation forest	A forest area established by planting or sowing with using either alien or native species, often with one or few species, regular spacing and even ages, and which lacks most of the principal characteristics and key elements of natural forests.

OVERVIEW OF FORESTS

Table A2: FSC Definitions of Forest [17]

Forest	A tract of land dominated by trees.
Intact forest landscape	A territory which contains forest and non-forest ecosystems minimally influenced by human economic activity, with an area of at least 500 km2 (50,000 ha) and a minimal width of 10 km.
Natural forest	• Forest affected by harvesting or other disturbances, in which trees are being or have been regenerated by a combination of natural and artificial regeneration with species typical of natural forests in that site. • Natural forests which are maintained by traditional silvicultural practices including natural or assisted natural regeneration. • Well-developed secondary or colonizing forest of native species which has regenerated in non-forest areas. • 'Natural forest' may include areas described as wooded ecosystems, woodland and savanna. • Areas which would initially have complied with the definition of 'plantation' but which, after the passage of years, contain many or most of the principal characteristics and key elements of native ecosystems, may be classified as natural forests. • Plantations managed to restore and enhance biological and habitat diversity, structural complexity and ecosystem functionality may, after the passage of years, be classified as natural forests.
Plantation	A forest area established by planting or sowing with using either alien or native species, often with one or few species, regular spacing and even ages, and which lacks most of the principal characteristics and key elements of natural forests.



OVERVIEW OF FORESTS

Table A3: PEFC Definitions of forest [19]

Forest	Minimum area of 0.5-1 ha. with a tree crown of more than 10-30 percent with trees with the potential to reach a minimum height of 2-5 meters at maturity. (Each regional or national standard includes specific values.)
Ecologically important forest areas	• Containing protected, rare, sensitive or representative forest ecosystems. • Containing significant concentrations of endemic species and habitats of threatened species. • Containing engendered or protected genetic in situ resources. • Contributing to globally, regionally and nationally significant large landscapes with natural distribution and abundance of naturally occurring species.
Forest plantation	Forest of introduced species, and in some cases, native species, established mainly for production of wood or non-wood goods and services.

IFC does not define forest within the Performance Standards, however they do have exclusions related to tropical moist forests. The World Bank includes a definition of natural forests and plantations in the EHS Guidelines for Forest Harvesting Operations [13].

Table A4: Forest types specified in IFC PS-6 Biodiversity [19] and the IFC Exclusion list [20]

Forest plantations	Forest plantations are considered modified habitats i.e. areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition.
Primary tropical moist forest (IFC Exclusion List, not otherwise defined)	Excluded: • Purchase of logging equipment for use in primary tropical moist forest • Financial intermediaries supported by IFC must exclude commercial logging operations for use in primary tropical moist forest and exclude from trade finance commercial logging operations or the purchase of logging equipment for use in primary tropical moist forest • Microfinance institutors supported by IFC must exclude commercial logging operations for use in primary tropical moist forest.
Natural forests (EHS Guidelines)	Forests where the principal characteristics of natural forests ecosystems (e.g. complexity, structure, and diversity) are present.
Plantations (EHS Guidelines)	Forests where most of the principal characteristics of natural forests ecosystems (e.g. complexity, structure, and diversity) are not present.

OVERVIEW OF FORESTS

6.1.2 Forest types and biodiversity characteristics

The world's forests are characterized based on latitude, and local and climate conditions that affect the type of forest that can grow, as follows. [21]

- Boreal forests are found between 50 and 60 degrees latitude in North America, Asia, and Europe. Cold climates lead to low species diversity compared to temperate and tropical forests.
- Temperate forests are located at mid-latitudes, which gives them their characteristic four seasons. Temperate forests are inhabited by species adapted for seasonality, e.g. deciduous trees like maples, hickories and oaks. Species such as bears, bobcats, squirrels, and deer make their homes in temperate forests and can store food, adapt their diet, or hibernate to cope with the lack of nutritious foods in the winter.
- Tropical forests located between the Tropics of Cancer and Capricorn are some of the most biodiverse ecosystems on Earth. These forests cover only a tenth of the surface of the planet, yet harbor half of all species. Tropical forests are known for their extraordinary biodiversity. The Amazon rainforest, for example, is home to 10% of the world's described species. The diversity of tropical forests makes them very efficient at processing nutrients. Dead and decaying matter is quickly broken down by decomposers and almost instantly taken up by another organism. This makes tropical forest soils nutrient poor.
- Subtropical forests are located between 25 to 40 degrees latitude either side of the equator, where temperatures remain above 10 C for at least eight months of the year. The forests in this region vary from humid forests (similar to tropical forests) to dry forests with more varied rainfall such as in the Mediterranean.

Annex A1 provides a more detailed breakdown of forest types.

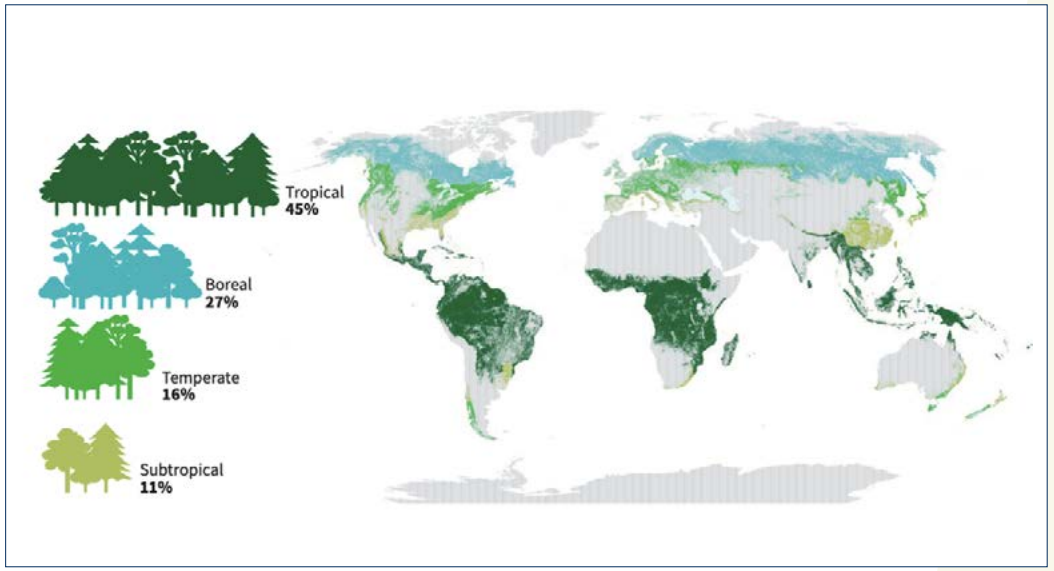


Figure A1 Proportion and distribution of global forest area by climatic domain
Source: Global Forest Resources Assessment 2020 Key findings, FAO.

OVERVIEW OF FORESTS

6.1.3 Condition of natural forests: key categories

Natural Forests can be categorized based on human interaction and the resulting condition of the forest, as shown below. Note, however, that defining which category applies to a parcel of land is not straightforward, and also that the category of a forest can change over time.

- Primary forest – natural forest where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed. [16]
- Secondary forests – forests regenerating largely through natural processes after significant removal or disturbance of the original forest vegetation by human or natural causes and displaying a major difference in forest structure and/or canopy species composition with respect to pristine primary forests. If unaffected by recurrent disturbances such as grazing, tree felling, and frequent fires, secondary vegetation may slowly be invaded by primary forest trees and can eventually revert to the original type. But the speed of change depends on the frequency and intensity of disturbance, and the availability of seed parents. [22]
- Degraded forest – one whose structure, function, species composition, or productivity have been severely modified or permanently lost as a result of damaging human activities. [23] Examples include deforested land under agriculture, forest where soils are exhausted or destroyed (e.g. by wildfire) and land where natural seed stocks are not available. A forest subjected to pressures, either small but sustained, or brief but intense, will at some point lose its capacity to recover.

Box A1: When is land degraded?

Determining whether land is ecologically degraded or not is complex. There is no single, internationally agreed definition of degraded land, however it usually is related to a certain degree of natural regeneration and/or production loss, caused by human activities. This could include provision of ecosystem services to people or the environment, ecosystem structure or species composition. The ability of land to recover and regenerate natural vegetation and habitats when relieved from external pressures also determines the level of ecological degradation.

Where a project site is described as (ecologically) degraded the following questions can help investors to understand what that means in the project's context.

- How does the project define (ecologically) degraded land?
- What criteria are used to determine whether land is degraded, and how has this been assessed?
- What is the natural ecosystem on the project site, and in the wider area or landscape?
- Has a biodiversity baseline been conducted?

Note that ecologically degraded land may still house important ecological or biodiversity values, and some degraded land may even regenerate and recover natural conditions when relieved from external pressures (such as intense agriculture or grazing by livestock). Also note that generally degraded land would be classified by IFC PS as modified habitat (i.e. when human activities have substantially modified an area's primary ecological functions and species composition), however impacts on biodiversity and ecosystem services still need to be assessed. Modified habitats can still be considered critical habitats if they meet the critical habitat threshold. Where habitats maintain their primary ecological functions and species composition they are considered degraded natural habitats (not modified habitats).

OVERVIEW OF FORESTS

6.1.4 Commercial tree species

The ITTO Tropical Timber Atlas [24] provides information on 300 tropical timber species, their local and botanical names, technical characteristics, main uses and source areas. The following species are most common in exports from emerging markets [25]:

- Logs – acacia; taun red meranti, okoumé; tali, kwila, okan, teak, rosewood; sapele and malas
- Sawn wood – rubberwood; dark red meranti;, sapele; kwila; mixed light hardwoods; ayous and keruing.

6.1.5 Planted forests: tree species

Planting to restore or regenerate natural forest involves a wide range of species selected because they are indigenous to the specific area. Plantation forestry typically includes a narrower range of species, selected for each site based on the objectives for the plantation (types of wood, markets and uses) and the characteristics of the site (e.g. soil type, rainfall etc). Site-species matching is a key element of plantation management. Non-native pines and species of eucalyptus make up a large percentage of the trees in plantations. The economic worth of plantation forests depends on the species choice and non-native species tend to be prioritized for this purpose, commonly acacia and tectona species alongside the aforementioned eucalyptus species and non-native pines.

Harvest times can vary significantly based on factors like climate, soil fertility, growth rate, and management objectives and practices. Some species are grown in shorter rotations for specific uses like pulpwood, while longer rotations are preferred for high-quality timber production. Shortening time to harvest can improve the economics of plantations and larger companies invest in selective breeding and intensive management to reduce growth cycles. This can reduce positive impacts. Research and development within the plantation sector primarily focusses on tree breeding and clonal development, e.g. to improve tree quality, growth rates and tree form, and on the potential for indigenous species to be grown in plantations.

Figure A2 shows the distribution between continents of indigenous and introduced species in plantations. Annex A2 shows

Figure A2: The proportion of introduced and native species in plantation forest, by region, 2020.
Source: Global Forest Resources Assessment 2020 Key findings, FAO.

OVERVIEW OF FORESTS

the tree species most commonly used in plantations in Africa, Asia or Latin America, approximate time to harvest and key uses.

The ecological impacts of plantation forestry vary little between species and are primarily a function of climatic conditions, soils and plantation management practices. Potential negative impacts such as loss of biodiversity, disruption of natural ecosystems, negative impacts on water availability, soil degradation, monocrop vulnerability and reduced genetic diversity may be mitigated by design and management. Mitigation of these risks is a key objective of sustainable forest management (see Section 7.3) and may be demonstrated through voluntary certification standards.

Box A2: Key statistics on global forests

- Forests account for 31 percent of the world's land area; in 2020, the world had a total forest area of 4.06 billion ha.
- More than half of the world's forests are in five countries – Russia, Brazil, Canada, the United States of America and China.
- 93% of the forest area worldwide is composed of naturally regenerating forests and 7% (290 million ha) is planted.
- Planted forest comprises 45% plantations for production and 55% other planted forest, e.g. for ecosystem restoration, water protection etc.
- 73% of the world's forest is in public ownership, though public ownership is declining and private ownership rising. In about 5%, ownership is disputed or in transition.
- About 30 percent of all forest is used primarily for production of wood and non-wood forest products.
- Plantation forests cover about 131 million ha (3% of the world's forests). In South America, 99% of the planted forest is plantation.
- Approximately a quarter of the world's forest is primary forest. Brazil, Canada and the Russian Federation host more than half (61 percent) of the world's primary forest.
- Most forest carbon is found in the living biomass (44 percent) and soil organic matter (45 percent), with the remainder in dead wood and litter. [1]
- The total carbon stock in forests decreased from 668 gigatonnes in 1990 to 662 gigatonnes in 2020; carbon density increased slightly over the same period, from 159 tonnes to 163 tonnes per ha [1].

6.2 State of forests and forest loss

6.2.1 State of forests

FAO publishes a global forest resources assessment (FRA) every five years. [26] The latest published assessment and country reports are for 2020. The assessment is based on data provided by member countries; the country reports are also published and available as a searchable data base. They include information on national level data sources and key institutions.[7] FRA includes data on forest cover (by type of forest) and forest carbon. The next assessment, FRA 2025, will examine the status of, and trends in, more than 60 forest-related variables in 236 countries and territories in the period 1990–2025.

[7] Country reports have the following sections: Introduction; Forest extent, characteristics and changes; Forest growing stock, biomass and carbon; Forest designation and management; Forest ownership and management rights; Forest disturbances; Forest policy and legislation; Employment, education and NWFP; Sustainable Development Goal 15.

OVERVIEW OF FORESTS

6.2.2 Forest loss [1]

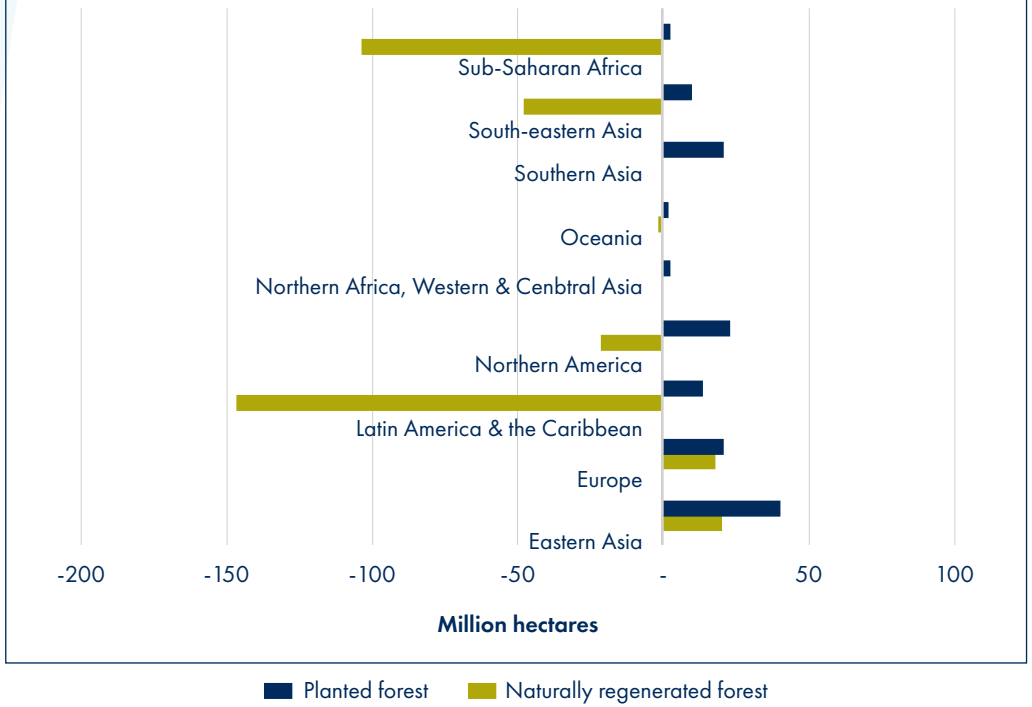
The world has lost 178 million ha of forest since 1990, an area about the size of Libya. However, since 1990 the rate of net forest loss decreased substantially due to a reduction in deforestation in some countries, plus increases in forest area in others through afforestation and the natural expansion of forests. The pattern of loss and net loss varies over time and by geographic region.[8]

- Africa had the largest annual rate of net forest loss in 2010–2020, and the rate of net forest loss has increased in each of the three decades since 1990.
- The rate of net forest loss has declined substantially in South America, to about half the rate in 2010–2020 compared with 2000–2010.
- Asia, Oceania and Europe saw net gain of forest area in 2010–2020.
- The area of primary forest has decreased by 81 million ha since 1990, but the rate of loss more than halved in 2010–2020 compared with the previous decade.
- The area of forest in protected areas globally has increased by 191 million ha since 1990, but the rate of annual increase slowed in 2010–2020.
- Some areas have high levels of forest cover and low rates of deforestation (HFLD).
- In the tropical domain, fire burned about 4 percent of the total forest area in 2015. More than two-thirds of the total forest area affected was in Africa and South America.[9]

Gains in forest area are primarily in planted forest, with losses generally in naturally regenerated forest.

Global Forest Watch publish annual data on loss of forest cover globally. Data for 2000-2023 shows that in tropical regions agriculture is the main cause of tree cover loss: in Africa, mostly shifting agriculture, and in South-east Asia, mostly commodity crop production [27]. The database includes country-level reviews for Bolivia, Brazil, Cambodia, Colombia, Democratic Republic of the Congo, Indonesia, Paraguay and Peru [28].

Figure A3: Net area change 1990–2020 of naturally regenerated and planted forests by region
Source: Global Forest Outlook 2050, FAO



[8] FAO defines deforestation as the conversion of forest to other land uses (regardless of whether it is human-induced). "Deforestation" and "forest area net change" are not the same: the latter is the sum of all forest losses (deforestation) and all forest gains (forest expansion) in a given period. Net change, therefore, can be positive or negative, depending on whether gains exceed losses, or vice versa.

[9] FRA 2020 does not report if fire was man-made or naturally occurring.

OVERVIEW OF FORESTS

Box A3: Tracking annual rates of forest loss [29]

WRI track forest loss annually based on geospatial data. 2022 data shows the tropics lost 10% more primary rainforest in 2022 than in 2021, the loss totalling 4.1 million hectares, the equivalent of losing 11 football (soccer) fields of forest per minute. At the national level, while primary forest loss ticked up in the two countries with the most tropical forest, Brazil and the Democratic Republic of the Congo, it rapidly increased in other nations like Ghana and Bolivia. Meanwhile, Indonesia and Malaysia have managed to keep rates of primary forest loss near record-low levels.

Box A4: High forest low deforestation areas

High forest low deforestation areas (HFLDs) are countries and subnational jurisdictions that have high extents of forest cover and low ongoing rates of deforestation. Many HFLD regions feature a high concentration of biodiversity, essential ecosystem services, and additional climate benefits, providing a safeguard for traditional communities and their cultural heritage, on top of their massive carbon storage and mitigation capacity. Environmental Defense Fund (EDF) estimate that 24% of the world's forests, close to one billion hectares, are located in HFLD regions [30]. (Gabon is an example of a HFLD country with 88% forest cover and less than 0.08% lost annually. [31]) Forest carbon systems for protecting forests do not apply to HFLD areas because carbon market methodologies for forest-related activities are either based on reducing high levels of forest loss or planting more trees. It is argued that without the proper financial incentives for active maintenance of these forest carbon stocks, there is no guarantee that forests in HFLD areas will remain effectively protected in the long run and avoid the transition to low forest, high deforestation.

6.3 Forests as a Nature-based Solution (NbS)

NbS are actions to protect, conserve, restore, sustainably use and manage natural or modified ecosystems while simultaneously improving human well-being, ecosystem services, resilience and biodiversity.[10] NbS can be used to target major challenges such as climate change, disaster risk reduction, food and water security, biodiversity loss and human health. Forests can potentially address all of these challenges and are therefore good candidates for NbS. [32] It is argued that some societal challenges (e.g. climate change mitigation) cannot be fully addressed without NbS. NbS projects can be controversial with concerns expressed, for example, about risks of not achieving projected benefits and having negative social impacts.

The IUCN Global Standard for Nature-based Solutions [33] was developed in order to give clarity to the concept of NbS and provide guidance on the steps needed to develop a successful NbS project. The Standard has eight criteria with associated indicators and is designed to be self-assessed, not verified by a third-party. Representatives of Indigenous Peoples have raised concerns about NbS. In particular the concern that the design and implementation of NbS do not always respect the rights of Indigenous Peoples and Local Communities, and that environmental integrity is not assured. There are calls for more safeguards and for standards for NbS to be consistently and thoroughly applied. [32]

Some common NbS related to forests are:

- Avoided deforestation or degradation projects – keeping forests standing that would otherwise have been cut down; maintaining natural forests. i.e. REDD+ projects.
- Restoring mangroves – mangroves provide a number of important ecosystems services such as coastal protection, carbon sequestration and storage, and resilience and preservation

[10] Adapted from UN Environment Assembly multilaterally agreed definition, 2022, included in UNEA 5.2 Resolutions [104]

OVERVIEW OF FORESTS

of critical habitat for biodiversity including commercially important species.

- Plantations – it is possible for plantations to be considered NbS, however not all plantations qualify. For a plantation project to be considered a NbS it must demonstrate benefits to biodiversity and either recovery of the native ecosystem or replacement of a monoculture plantation with mixed native species. (Only in situations where land is severely degraded could a non-native monoculture be considered as a NbS.)[11]

6.4 Forests and people

Globally, forests hold immense social importance, serving as vital sources of livelihoods, resources, and cultural heritage. With over 4 billion people living within 5km of a forest, trees play a significant role in people's physical and mental wellbeing. For millions of people, particularly in rural and indigenous communities, forests are not merely patches of land but integral parts of their identities and ways of life. Forests provide essential resources such as food, fuelwood, medicine, and building materials, sustaining traditional livelihoods and ensuring basic needs are met. Moreover, forests serve as gathering places for social interactions, ceremonies, and cultural practices, fostering a sense of belonging and interconnectedness among community members. For indigenous peoples especially, forests are repositories of ancestral knowledge, stories, and spiritual significance, serving as living landscapes that connect them to their heritage and ancestors. These ecosystem services provided by forests are explored further in Section 6.6.

Forests are of particular importance to Indigenous Peoples since many indigenous cultures have an intimate relationship with nature, resulting in an inherent respect for and protection of the local environment. 36% of the remaining intact forest landscapes are found on Indigenous Peoples' land, and the rate of loss of intact forest landscapes on Indigenous Peoples' land has been considerably lower than on other land [34]. Particular considerations for forestry investment with respect to Indigenous Peoples can be found in Section 14.7.

6.5 Forests and climate

Climate change has led to an increase in average global temperatures, with some areas becoming warmer and drier, and others warmers and wetter. Additionally the frequency and intensity of extreme weather events, such as droughts and storms, has increased. As a result forests are likely to be subjected to an increase in natural disturbances both abiotic and biotic. Areas that become warmer and drier are likely to experience more drought, forest fires and invasion by insect pests; whereas areas that become warmers and wetter are likely to experience higher wind speeds and increased outbreaks of disease [35].

Changes in local climate conditions could change the species most suited to a plantation area. Site-species matching is a key part of successful plantation management (see 7.2.4) and it is important not to make assumptions based on historical information if average temperature or volume and patterns of rainfall have changed. Regular monitoring of project impacts on factors such as ecosystem services and water availability is important to track whether project impacts change, e.g. as an area becomes drier, projects may begin to have an impact on water availability. This monitoring can feed into a project's adaptive management process.

6.5.1 Forest microclimates

Forest microclimates are known to be a key regulator of many ecosystem services provided by forests, although detailed understanding of how microclimates within

[11] A focus solely on tree planting for carbon sequestration has led to some projects claiming to be NbS that replace diverse native forest with non-native monoculture plantations – claims like these have led to the call for greater environmental integrity for projects that label themselves as NbS [105].

OVERVIEW OF FORESTS

and below tree canopies modulate biotic responses to global change at the species, community and ecosystem level is still limited. [36]

The climate for organisms living within and or beneath forest canopies is different to the climate outside forests - direct sunlight and wind speed are reduced within a forest compared to open space. This results in a buffering effect whereby forest microclimates have less temperature and humidity variation than outside forests i.e., there are cooler maximum temperatures and warmer minimum temperatures within forests compared to open sites. The magnitude of buffering is dependent on the structure of the forest, ambient temperatures and local water balance.[12]

Forests with complex structures, e.g. primary forests, have heterogeneous microclimates at a fine spatial scale, both horizontally across the forest and vertically from the ground to the canopy. The conditions within the canopy on a sunny day are warmer and dryer than those below the canopy. Trees experience different challenges across their lifetimes as a result of microclimatic conditions: saplings growing up from the forest floor are sheltered from extreme variations in temperature and humidity, but, if in dense forest such as primary tropical rainforest, will experience extremely low light levels, with up to 97% of daylight filtered out [37]. In contrast, once the crown has reached the canopy, leaves adapt to a different microclimate where sunlight is not limited but temperature and humidity vary to a greater degree.

Microclimates are not constant. When a tree is lost, this results in a canopy gap, letting in more direct sunlight and thus altering the microclimate at that spatial scale. Forest type affects forest microclimates.

- Temperate forests with seasonal foliage experience less pronounced buffering on temperature and humidity when trees have lost their leaves, compared to when they are in full leaf.

Eucalyptus trees at differing stages of maturity – 1 and 3 years.

[12] Water balance is the balance between precipitation, evapotranspiration and run-off.

OVERVIEW OF FORESTS

- Plantations with even-aged single species composition have a more homogenous microclimate, although it will still vary from the macroclimatic conditions in open space.
- Plantations do not buffer temperature and humidity variations as much as natural forest structures [36].

Climate change has an impact on forest microclimates. As regional macro climates are experiencing more extreme temperatures, forests may provide microrefugia for some species due to buffering effects. It is already observed that forest species sensitive to changes in temperature and humidity move between forest microclimates, for example frogs in the Philippines move closer towards the tree canopy at higher elevations mirroring the shift in optimal microclimate conditions [36].

Higher maximum daily temperatures during warm seasons will lead to more intense, more persistent and more frequent heatwaves in many areas. This is expected to affect temperate forests in particular, and can lead to widespread crown defoliation, tree mortality and an increase in the risk of forest fires as dry fuel accumulates. A threshold of approximately 75% canopy cover is required for temperate forests to maintain their buffering capacity, and falling below that level would exacerbate the impacts of heatwaves and significantly reduce the resilience of the forest [36].

Deforestation has a significant impact on forest microclimates as the microclimates are dependent on the presence of trees to exist. Forest degradation can also have a detrimental effect on forest microclimates by reducing the complexity of the forest understory and therefore reducing the heterogeneity of the microclimates within the forest. The removal of trees alters the microclimate. This can happen naturally e.g. through the action of leaf-cutter ant herbivory reducing canopy cover, however the impacts of anthropogenic activities that cause degradation tend to be greater and/or reoccurring [36].

Forest fragmentation alters microclimates within the forest patch, with a reduction in temperature and humidity buffering at the edges of each patch. This results in the species at the edge of the patches being more susceptible to extreme fluctuations in temperature and humidity. This can have an impact on biodiversity distribution, with some species moving towards the center of forest patches to avoid the edge effects.

6.6 Landscapes and ecosystems services

The landscape and the ecosystem services perspectives provide conceptual frameworks that can be applied to forests.

- A landscape is "a socio-ecological system that consists of interconnected natural and/or human-modified land and water ecosystems and which is influenced by distinct ecological, historical, economic and sociocultural processes and activities" [38] The landscape approach[13] is a holistic way of looking at landscapes and the people within them. It is a framework through which stakeholders (including local communities, local businesses, the finance sector, government) can collaborate to reconcile competing social, economic and environmental objectives and develop inclusive and transparent landscape plans [38]. For a landscape approach to work well, a partnership of all relevant stakeholders needs to be developed and maintained, and have access to funding and expertise.
- An ecosystem services approach focuses on the ecological functions of an ecosystem and the interactions with people through four strands of benefits: provisioning, regulating, supporting and cultural. The ecosystem approach is "a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way" [39].

[13] Also referred to as 'landscape perspective' or 'landscape planning'.

OVERVIEW OF FORESTS

Forest ecosystems can provide a wide variety of ecosystem services such as carbon sequestration and storage, biodiversity conservation, watershed services, soil conservation, recreational services and local climate regulation. Forests are home to over 80% of all terrestrial species and also provide sources of food, medicine, drinking water and recreational and spiritual benefits for millions of people [40]. Rural households in Latin America, Africa and Asia get between 20 and 28% of their annual income from forests [41], with half of this as non-cash income such as food, fuel and building materials [42]. Sustainable forest management (see Section 7.3) is generally considered to be an ecosystem approach.

The type of forest has an impact on the ecosystem services a forest provides.

- Plantations with even-aged homogenous stands of non-native species will likely maximize timber production, but within plantation stands may reduce other ecosystem services including, soil nutrients, pest control, and biodiversity compared to heterogeneous natural forest of native species.
- Forests managed for timber production often have less dead wood on the forest floor compared to natural, unmanaged forests which reduces the populations of decomposing organisms, such as insects and fungi, and therefore reduces ecosystem services such as nutrient cycling [43].

Image courtesy of Partnerships for Forests

- Cultural services are also generally greater in natural forests than plantations, with an increase in biodiversity and forest structure (i.e. trees of different ages, understory plant and shrubs etc) leading to higher aesthetic value [42].

6.7 Key institutions and information sources

UN agencies, affiliate organizations and programmes lead much international work related to the forestry sector, based on agreed goals [44].Development banks, notably the World Bank, and global conservation organizations, especially IUCN and Conservation International have their own work streams but are also active in a range of partnerships and initiatives, most of which are UN lead. The European Union's role in the tropical forest sector is growing in importance for European investors through the EU regulation on deforestation free products entering EU markets. This regulation sets environmental criteria for all forest risk commodities, including wood and wood products as well as commodities such as soy, beef and palm oil. Key information sources are:

- FAO for forest data
- TTO for data on trade in wood products
- Verra and Gold Standard registries for information on voluntary carbon credit projects under development and in operation.
- Forest Management Plans for both private forestry projects and publicly managed protected areas
- Project Design Documents (PDD) for voluntary forest carbon projects.

Annex A5 lists key international organizations with a brief description of each, focusing on aspects of greatest relevance to investors. Annex A6 lists key international initiatives in the forestry sector of potential relevance to investors as of July 2023.

FOREST PRODUCTS

7.1 Forest Sector Outlook for 2030 and beyond

7.1.1 Introduction to the sector and asset class

The forest sector as discussed in this guide has two distinct components: production of forest products (wood and wood products) and production of carbon credits. Each has its own markets and production processes. The forestry value chain is complex and involves a wide range of industries and stakeholders, from forest owners and managers to manufacturers, retailers, and consumers. A forestry sector asset may comprise only logging of natural forests or a plantation or include sawmills and further processing; it might include a forest carbon dimension too. Some assets that focus on processing have a plantation or a smallholder element. Assets vary in size. The sector includes huge global companies (particularly in pulp and paper) with businesses worldwide along the value chain. Others are small, local sawmills.

The asset class may also include production of non-timber forest products (NTFPs), sustainable charcoal and biochar, and payment for ecosystem services (PES) production other than carbon, e.g. biodiversity or water credits. This guidance document focuses on forestry and carbon credits as the main assets produced by the forest sector. This guide does not include discussion of agroforestry systems that intersperse tree crops such as cacao with indigenous trees and plantations of trees that produce commodities, e.g. cacao and tree nuts. These are not generally considered as part of the forest sector because the markets for agroforestry tree crops are separate for those for wood. However, tree crops often form part of REDD+ carbon projects with smallholder crops such as cacao and coffee supported in the buffer zones of protected forests, and environmental and social challenges are similar. However, the guide is relevant to some types of agroforestry or silvopastoral systems that target periodic tree harvest and income from the timber e.g. those where trees are planted around the edge of crops or pasture as an additional source of income. This could be as part of an out-grower scheme.

Box A5: Example of a project with multiple components [45]

Kilombero Valley Teak Company (KVTC) was established in 1992 and is one of the most innovative forest management projects in Africa, bringing a wide range of social, economic and environmental benefits to a remote area of Tanzania. The project includes planting and harvesting of plantation teak; the protection and management of over 20,000 ha of native forests and wetlands and an integrated processing plant to produce timber and value-added product. The Forest Management Plan 2022-2055 [46] notes that in the future the company may also undertake some harvesting within natural forest areas.

7.1.2 Wood and wood products

FAO estimates[14] the global value of international trade in forest products at US$244bn in 2020. This includes roundwood and sawnwood as well as wood pellets, wood-based panels, wood pulp and pulp from other fibres, recovered paper, paper and paperboard. The majority is produced in The Americas and Europe, with only 30% of roundwood and sawnwood produced in Africa, Oceania and Asia [3]. Modelling projects a 54% increase in global wood harvest from 2010 to 2050 [47]. Key crops in the wood sector are softwoods such as pine and cedar; hardwoods including eucalyptus and tropical woods such as such as merbau, rosewood, ebony, and padauk, and bamboo.[15] Timber

[14] Based on data in the FAO Forestry Production and Trade Dataset [3]. In addition to international trade there is a large volume of domestic trade in wood and wood products, formal and informal.
[15] Bamboo is not technically wood but serves many of the same markets.

FOREST PRODUCTS

from agroforestry and silvopastoral systems contributes to supply, mostly in Asia and Africa, for local use. (Where data is available on wood sourced from agroforestry this is usually reported as production from the planted sector.) Species composition and management practices prevents this being a supply for modern wood industries except where the system is specifically designed to produce industrial roundwood. However in view of rising competition for land, agroforestry and silvopastoral systems are of increasing interest to investors because of the potential for early returns, revenue diversification and contributing to more sustainable agricultural practices [2].

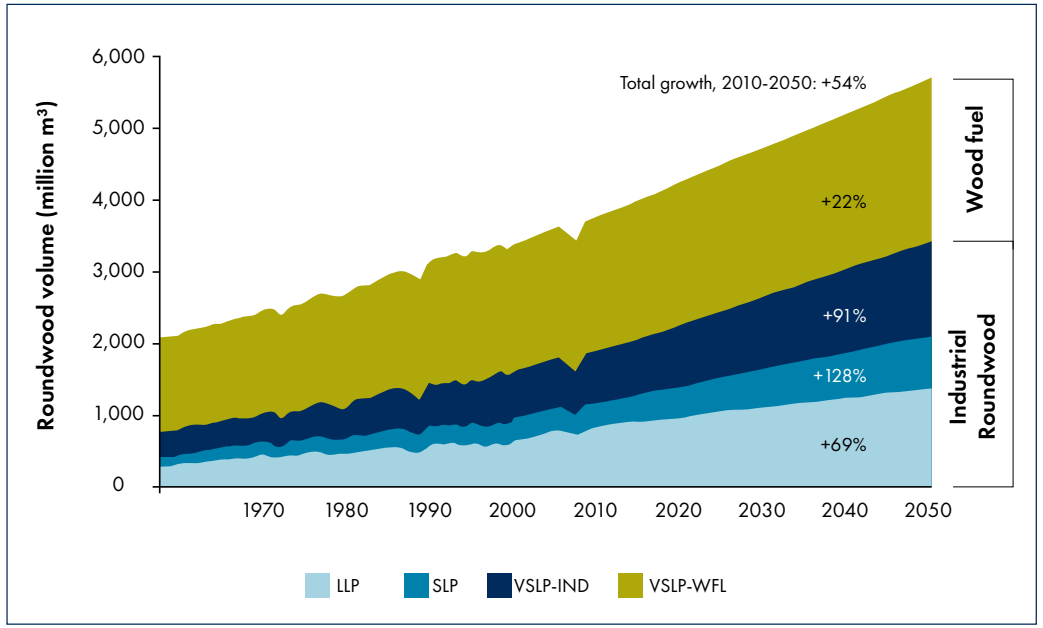


Figure A4: Historical and projected increases in global wood production, 1961-2050.
Key: LLP- sawnwood, wood panels, industrial roundwood; SLP – paper and paperboard products; VSLP-IND – wates of wood processing used for energy; VSLP-WFL – wood harvested to burn for energy.
Source: Peng, L., Searchinger, T.D., Zionts, J. et al. The carbon costs of global wood harvests. Nature (2023).

The UNECE Forest Sector Outlook Study 2020-2040 [48] identifies global trends relevant to forest sector investments.

- Non-tariff measures, such as phytosanitary regulations, log export bans or requirements for certificates of legality or sustainability, will continue to impact global trade. E.g. The European Union Regulation on deforestation-free products [49].
- Digitally enhanced data collection across the forest product value chain that could boost its productivity and efficiency.
- Urbanization, affecting the ways that forests are managed, the demand for products and services, workforce availability in rural areas, and forest ownership.
- Plantations producing an ever-greater share of the world's industrial wood output.

7.1.3 Forest carbon

Forest carbon – forest restoration; other tree planting; improved forest management with reduced impact logging; and avoided deforestation can earn tradeable carbon credits. FAO reports [50] the value of forestry and land use credits for 2021 (through August) at $544mn through 115 million forestry carbon credits (1 carbon credit = 1tCO_2e). The volume of credits sold has been expanding but this remains an embryonic market compared with that for forest products.

7.2 The Forest Sector

7.2.1 Key aspects of forest management

Commercial forestry typically bases operations around long-term (but regularly updated) Forest Management

FOREST PRODUCTS

Plans which set out in detail the land use, technical, commercial and E&S aspects of the project.

The principal activities involved in protecting natural forests, restoring natural forest and establishing and managing plantations differ. For any area of land that is to be protected; restored, or where plantations are to be established, a first step is to assess forest type and condition to determine the broad options available. The following general considerations apply.

- Primary forest areas are generally designated for conservation, and potentially for the 'harvesting' of carbon credits. Note however that some jurisdictions do issue permits for logging or land conversion in primary forest under certain conditions, e.g. deforestation may be permitted on farms in Brazil where the legally mandated area of preserved natural forest is exceeded.[16]
- Secondary natural forest is often used for conservation or restoration, and also potentially for 'harvesting' carbon credits. In some circumstances, secondary forest may be used for selective harvesting.
- Plantations may be considered where the natural forest is too degraded to restore, including where natural forest was initially replaced by agriculture. Plantations may also be considered to meet increased demand for forest products whilst also reducing the demand on natural forest assets.

Forest type and condition analysis is relevant, for example, to landscape plans; plans for national parks and other protected areas and to forestry management plans. Determining if forest is primary, secondary or degraded (and to what degree) is complex and requires input from specialist local forest experts and experts on degradation and recovery.

7.2.2 Natural forest protection, restoration, regeneration

Protection and restoration are often important parts of forest carbon and timber projects, e.g. High Conservation Value (HCV) areas, riparian zones, water bodies and sensitive areas (including slopes, cliffs, areas with certain soil types) are required to be set aside under FSC and these may require regeneration, restoration, protection or a combination of all three. Key aspects are:

- The areas, boundaries and ownership of natural forest areas under protection must be delineated and specific, site-specific / forest management unit[17] protocols developed for how protection will be achieved, and the responsibilities of the various stakeholders. E.g. areas may be under overlapping control by national parks authorities and Indigenous Peoples; managers of primary forests must determine under what circumstances there is access for researchers and community members for NTFP recovery. Often protected natural forests are divided between areas under absolute protection and areas where limited and controlled human activity is permitted.
- Restoration or regeneration of natural forest may be achieved by 'passive' or 'active' methods. Usually a combination of approaches is deployed, and the approach may change over time with experience at a site, e.g. finding that natural regeneration works better, or less well, than expected and adapting management accordingly. Regeneration or restoration to a natural forest ecosystem is a complex process and specialist expertise should be called upon to design the restoration plan for each site. Tree species from old growth forest may not survive active planting in open areas and pioneer species may need to be grown initially to provide the microclimate needed for other

[16] Under the Brazil Forest Code, 2012, landowners must retain (or undertake natural forest restoration) such that the specified percentage of their land is under natural forest. In the Amazon biome, 80% of a rural land holding must be natural forest.
[17] Forest Management Units (FMU) may be for specific production areas or for a forest as a whole.

FOREST PRODUCTS

forest-adapted species to thrive. Where restoration is mandated by government, regulations may establish required approaches and species. Active restoration, through sowing seeds or planting seedlings, is considerably more labor intensive and costly than natural regeneration. In some cases, restoration is to an earlier, non-forest state.

As experience in forest restoration grows, guidance on successful approaches has been produced, such as the ITTO Guidelines for Forest Landscape Restoration in the Tropics which sets out principles and guidelines for forest restoration, alongside case studies from Latin America, Africa and South East Asia [51].

7.2.3 Natural forest management for timber

Note: MFF will be publishing a detailed analysis on E&S risk and impact management for the (sustainable) natural forest management (NFM) sector, including a detailed analysis on the gaps between FSC certification and IFC Performance Standard compliance. This complements the information in the section below, with more detailed descriptions and explanations. The paper will be available on the MFF web pages from late 2024.

Box A6: Example of riparian area protection

In South Africa many plantations were established on land that originally was grassland. When initially set up all available land was used for production. As the plantations are harvested, they are being replanted in a responsible way, riparian and sensitive areas set aside according to regulatory and Sustainable Forest Management (SFM) requirements. Riparian zones, for example, are being restored to natural ecosystems, in some cases grasslands, with active weed management required for the first years before the native species, whose seed has remained naturally within the soil's seedbank, becomes established.

Box A7: A large-scale forest carbon project in Latin America incorporated a multi-stage process for planning its activities

Project planning can take several stages, particularly when projects are large-scale. A forest carbon project in Latin America began by using existing land use maps from the national parks service to conduct an initial assessment of forest type. The next stage involved the collection and detailed assessment of satellite imagery over ten years and provided a much more granular analysis into over 30 land use types and the condition of each area. This analysis was used to determine which land areas were potentially eligible for which type of project activities. In this case on average across the sites approximately 60% of the area assessed was deemed eligible. In parallel, social and environmental studies identified areas where land ownership was disputed or unclear, or where consent from landowners or users was needed, etc. This further reduced the land area available for the project. Finally, prior to project implementation on each area, detailed field survey-based plans were drawn up defining, for example, areas for natural regeneration, assisted regeneration, as well as which species would be seeded or planted and where the seed or seedling stock would come from.

Management of natural forests used for timber production has two main components: harvesting and regeneration.

Best practice for harvesting is selective logging based on generic forest and stand level inventory and reduced impact logging (RIL), i.e. the intensively planned and carefully controlled implementation of timber harvesting operations to minimize environmental impacts on forest stands and soils. The goal of reduced impact

FOREST PRODUCTS

logging is to maintain forest ecosystem health and biodiversity while still allowing for sustainable timber extraction. While reduced impact logging is designed to be more environmentally and socially responsible than conventional logging, there can still be varying degrees of impact depending on how the techniques are applied and the specific context of the logging operation, e.g. if not properly managed to ensure a sustainable forest off-take, it can result in the continued degradation of the forest or the long-term conversion of a natural forest into a forest of a limited number of species in an even-aged structure that more closely resembles a natural forest plantation.[18]

Clear-cutting is a logging practice in which most or all trees in an area are uniformly cut down. This is more widely practiced in boreal than in tropical forest. Any project involving clear-cutting of tropical natural forest faces the challenge of demonstrating that it is not in an ecologically sensitive area, will maintain biodiversity and that the forest and ecosystem can be sustainably managed.

Regeneration after logging in natural forest is normally through natural regeneration although in some cases enrichment planting may be used. Fertilizers may be used to ensure a better opportunity for vulnerable species (as is also the case in any restoration of natural forest).

Salvage (or sanitation) logging is the felling of trees that have been damaged due to pests, diseases, wind or fire in order to salvage any remaining commercially viable timber and maintain the health of the forest. Whilst recognized as an important process to maintain forest health, salvage logging is vulnerable to exploitation, for example if salvage permits are used to fell healthy trees. In 2021 this became a concern in Russia, where one-seventh of the volume of wood harvested was reported to be from salvage logging [52]. FSC responded by issuing a moratorium on timber from trees felled with salvage logging permits until more stringent controls are implemented to prevent illegal salvage logging [53].

Box A8: Key principles of RIL

- Selective harvesting: logging focuses on removing specific trees or groups of trees.
- Minimizing soil disturbance: machinery and equipment used in RIL are designed to minimize soil compaction and disturbance.
- Protection: Protecting important habitat features, such as water bodies, wetlands, and wildlife corridors.
- Limiting logging roads: to reduce the fragmentation of the forest and minimize the potential for erosion, habitat disruption and uncontrolled access leading to deforestation. An extreme example is heli-logging, where harvested trees are removed by helicopter, mostly deployed in North America.
- Erosion control: e.g. constructing proper drainage systems and implementing buffer zones around water bodies help prevent soil erosion and sedimentation of watercourses.
- Respecting Indigenous and local communities: minimizing disruption to Indigenous and local communities that rely on the forest for their livelihoods.
- Regular monitoring and adaptive management: ongoing monitoring to assess the effectiveness of the techniques used and making adjustments based on the results of monitoring.

[18] For discussion of the pros and cons of selective logging see [106]

FOREST PRODUCTS

7.2.4 Planted forest design and management

Plantations may comprise native species or non-native species depending on management objectives. Systems for establishment, maintenance and harvesting are driven by the management objectives for the plantation and usually described in the Forest Management Plan.

Key considerations in greenfield plantation design and planning include the following.

- Understanding the landscape, e.g. riparian zones, HCV areas, sensitive sites, threatened and endangered species that require protection, interaction with the wider landscape.
- Understanding the water balance, including the geohydrological dynamics of the catchment area respective to the (foreseen) location of the forestry plantation project. This may be of specific importance for plantations upstream water scarce areas, and/or for water intense plantations that may compete with other water consumers such as local communities and neighbouring forests or areas of agricultural production.
- Understanding the soil which may involve using a specialist to conduct a soil survey. Soil surveys typically look at the type of soil, effective depth of soil, carbon content, water storage capability and nutrients. The output is a map showing the soils within the site, indicating the areas suitable for planting and those that are not, e.g. those with shallow soils, rocky areas or riparian zones. This is a key input for site-species matching and can contribute to HCV and habitat assessments.
- Site-species matching is critical to optimize productivity and minimize risks of species having a negative environmental impact e.g. planting a species with high water requirements in an area that is not climatically suited to the species may have a negative impact on the local water table, whilst also limiting the productivity of the plantation. Factors that can influence site-species

Manual tree felling underway at a plantation in Ghana

FOREST PRODUCTS

A controlled chemical spraying in preparation for new planting.

matching include water availability, average temperature, soil composition and depth.

- Defining stand sizes and layout to optimize productivity and conservation, e.g. by using mosaic designs, and planning road layout for efficient access for management, protection and extraction.

The use of non-native species in plantations is common, with the most common plantation species globally being pine (or Pinus species) and Eucalyptus species. FSC, and some national legislation, require use of non-native species to be justified and may require use of indigenous alternatives to be explored. Most non-native species carry a risk of becoming invasive, this needs to be managed through control of any spread outside of planted areas.

Smallholder plantations growing to supply a commercial sawmill need to carry out all the steps from site and land preparation, through planting, fertilisation, plant protection, pruning and thinning outlined above. Usually less intensive methods will be used throughout unless the related plantation/forest processing project manages operations (planting, pruning, thinning and harvesting) for its out-growers, sometimes using specialized contractors.

Site-species matching is critical to optimize productivity and minimize risks of species having a negative environmental impact

FOREST PRODUCTS

Box A9: The key steps in establishing and managing a plantation

- **Land Preparation** – may include cool burning or slashing of old vegetation, chemical spraying of existing vegetation, or intensive bush clearing operations using heavy machinery. Consideration is normally given to leaving remnant native tree species.
- **Soil Preparation** – to facilitate good establishment of the plantation species in rows at defined inter-row distances. In established plantations this is usually done through minimal impact activities. In new projects there may be a need to start by using heavy machinery to break up areas of soil compaction or stone layers.
- **Planting** – ranges from simple manual planting of trees at predetermined spacing through to the use of machinery with planting tools, which may be fitted with computerized planting programmes linked to GPS systems to ensure optimal planting.
- **Weeding** – starts soon after establishment and goes on until surrounding vegetation is no longer a threat to the trees, generally this is when canopy cover is achieved. Weeding might be done by hand, mechanically or using herbicides.
- **Pest Management** – best practice is to use Integrated Pest Management approaches. This requires consideration for the least impact methods and justification for the methodology used.[19]
- **Fertilisation** – at planting to provide desired species with a better chance of out-competing other vegetation, or to replenish essential nutrients in depleted soils, especially on degraded sites.
- **Pruning** – of lower branches of trees to improve access; for fire prevention (to inhibit the spread of fire from the ground into the canopy) and for timber / fibre quality measures to create knot free timber.
- **Thinning** – may be done to optimize site productivity by reducing the stocking level of plantation trees at varying times in the rotation and reduce stress on remaining trees. Thinning operations may be non-productive or produce a limited volume of forest products. Methods may be low intensity manual or more intensive technical mechanized operations.
- **Harvesting** – methods may be low intensity manual operations or high intensity mechanized operations. Plantation harvesting is normally done using a stand clearcut methodology.
- **Fire Management** – requires planning to ensure that fire protection breaks, equipment and labor are available during fire seasons. Fire protection often needs to include community engagement to limit risks of fires spreading onto or from the plantation area.
- **Protection** – against activities such as non-permitted hunting, fishing and collection of forest and non-forest products.
- **Road planning and maintenance**, including to reduce impact of roads on sensitive sites, e.g. riparian zones and hydrological assets.
- **Post-harvesting** – land preparation for another rotation of plantation trees, or for post-plantation management as per the forest management plan.

[19] Where chemical pesticides are used international best practice guidelines are available through ILO Safety in the Use of Chemicals at Work [107] and ILO Safety and Health in the use of Agrochemicals [108].

FOREST PRODUCTS

7.3 Sustainable Forest Management (SFM)

7.3.1 Concept

Sustainable forest management is a core concept in the forestry sector. SFM aims to ensure that forestry projects deliver social, environmental and economic benefits, balance competing needs, and maintain and enhance forest functions now and in the future.[20] The concept developed as a result of the 1992 Earth Summit in Rio de Janeiro, which led to the Rio Declaration and Agenda 21 that emphasized the need for sustainable forest management as part of sustainable development. FAO, the Forest Stewardship Council (FSC) and others have contributed to the development of principles and criteria for sustainable forest management. These encompass environmental, social, and economic aspects, aiming for a holistic and balanced approach. FSC applies the principles of SFM through what it calls Responsible Forest Management.

At a jurisdictional level a few countries, e.g. Finland, have legal requirements for SFM or national SFM plans, e.g. Sweden and several Canadian provinces. SFM is also central to voluntary forest certification systems that guide forest owners and managers in meeting environmentally appropriate, socially beneficial, and economically viable criteria. Certification is a key tool for projects to demonstrate SFM and to connect the consumer, through the supply chain, with the sustainable origins of their products. Whilst certification is not a requirement for SFM, it is a requirement for many investors through the application of IFC PS (see Section 11).

7.3.2 Applying the concept

SFM can be applied to logging in natural forests and to plantation forestry. The specific practices that constitute sustainable forest management are defined for each project in its Forest Management Plan and involve design and management to achieve the following.

- Legal compliance: including to national laws, regulations and policy requirements, international agreements and guidelines compliance, respect for human rights.
- As relevant to each project: respect for Indigenous Peoples and traditional community rights (through an FPIC process); consideration of local community needs (including employment and skills development) from forest resources; respect for workers, their rights and protection of workers from hazards and risks associated with forest activities. See Section 14.
- Environmental management: including maintenance and enhancement of environmental values, such as natural ecosystems and biodiversity; natural assets like riparian and wetland zones; ecological corridors; rare, threatened and endangered species; natural ecosystem processes such as nutrient recycling, water filtration, water catchment; forest regeneration and health; landscape connectivity and the role played by the forest; and the protection, maintenance and enhancement of High Conservation Values (HCV). See Section 13.
- Sustainability of Forest Resources: including economic viability, sustainable harvest levels of timber and non-timber forest products that prevent overexploitation, ongoing regeneration and growth of forest resources, preservation and enhancement of ecosystem services.

[20] SFM is also referred to as Responsible Forest Management, because of perceptions that SFM only refers to sustainability of forest product outputs.

FOREST PRODUCTS

- Forest Protection: including protection from illegal activities, wildfire (considering that fire may also be an essential tool in ecosystem maintenance), spread of forest and human disease emanating from forest or associated with forest work, control of invasive species, specifically alien species, forest and natural ecosystem conversion and degradation. See Section 13.
- Integrated Pest Management (IPM): including prevention of outbreaks by using pest-resistant variants, continuous monitoring of tree health to identify issues quickly and management through mechanical and biological control in preference to synthetic pesticides. See Section 13.5.
- Planning and Monitoring: effective and cyclic planning based on achieving specified goals and objectives, adapted as needed based on monitoring and changing conditions, research and new information.

Box A10: Key Sections in a Forest Management Plan

These sections are consistent with FSC requirements, however details may vary by jurisdiction.

Forest Description: an overview of the forest's ecological and geographical characteristics, including information about its location, size, topography, climate, and soil types.

Forest Management Objectives: the long-term and short-term goals for the forest management activities, considering ecological, social, and economic aspects. Including commitments to responsible forest management and where relevant commitment to compliance with certification standards.

Legal and Regulatory Compliance: Details on compliance with local, national, and international laws and regulations related to forestry and land use.

Stakeholder Engagement: FSC emphasizes involving local communities, indigenous peoples, and other stakeholders in forest management decisions. The plan should describe how stakeholders have been engaged and their input considered.

Biodiversity Conservation: how the forest management plan promotes biodiversity conservation, protects endangered species, and maintains ecosystem health.

Harvesting Plans: Details about harvesting activities, including the selection of trees, logging methods, and techniques to minimize soil disturbance and protect water resources.

Reforestation and Regeneration: strategies for reforestation and natural regeneration, including information on tree species selection, planting techniques, and monitoring.

Environmental Impact Assessment: An assessment of potential environmental impacts of forest management activities and strategies to mitigate these impacts.

Social Aspects and Community Benefits: Information about how the forest management plan contributes to the well-being of local communities, including employment opportunities, infrastructure development, and cultural considerations.

Monitoring and Reporting: the system for monitoring the implementation of the plan's activities and their impacts on the forest ecosystem, social aspects, and economic outcomes.

Maps and Diagrams: Visual representations of the forest area, management zones, access routes, harvesting areas, and other relevant features.

FOREST PRODUCTS

7.3.3 Challenges in implementing SFM

Achieving SFM is a multifaceted endeavor that involves commitment towards ecological, social, and economic goals. Several challenges can hinder the successful implementation of SFM practices, including:

- lack of commitment by owners or management to implement SFM;
- lack of financial resources in the project to implement measures to achieve SFM;
- insufficient understanding and planning of SFM;
- lack of, or insufficient, baseline studies;
- conflicts between communities and forestry projects resulting from poor communications and/or economic hardship resulting in, for example, incursions on protected or natural ecosystems; grievances about employment especially where project needs for specialist skills brings in workers from outside the community; and suspicion of management leading to non-disclosure of key cultural sites, leading to unintentional damage of these sites.

Investors in projects proposing to undertake SFM should look for evidence of specifically how the project defines its approach to SFM; its understanding of the livelihood base of local communities; engagement with and commitments to communities; its understanding of and management approach to biodiversity and ecosystem services; and the budget, resources and top-level commitment that will be deployed to achieve SFM.

A Plywood factory in Ghana

7.4 Forestry product processing

Forestry product processing is divided into phases, primary, secondary and tertiary.

- Primary processing usually processes round logs, e.g. a sawmill, veneer plant.
- Secondary processing is a follow-on process like laminating or plywood manufacture, e.g for the construction industry.
- Tertiary facilities further process into products, e.g. furniture.

Primary processing is usually located close to forest areas, while secondary and tertiary processing is often located closer to end markets due to logistical considerations. Annex A3 lists the key facilities and activities involved in primary and secondary processing.

FOREST PRODUCTS

7.5 Wood trade

7.5.1 Overview

Most wood is produced and consumed domestically, not entering global trade. In 2021, over 90% of the logs produced in Asia Pacific and Latin America/ Caribbean were utilized domestically, and 88% in Africa. Tropical timber accounts for a small proportion of wood produced and exported.

7.5.2 International trade

Wood is classified in international trade by both the type of tree that wood derives from and by its form. The main (overlapping) categories of traded wood are:

Hardwoods: known for their strength, durability, and attractive appearance. Examples include mahogany, teak and eucalyptus.

Table A5: World production and export of wood, 2022 (million m3, rounded) [4]

		Logs	Sawnwood	Veneer	Ply
World total	Production	2,011	494	17	129
	Export	123	136	6	27
Tropical timber	Production	324	72	9	49
	Export	13	11	3	8

Softwoods: generally less dense than hardwoods. Examples include pine, cedar, spruce, fir, and redwood.

Tropical Woods: wood sourced from trees that grow in tropical regions with warm climates and high humidity. Many of these woods are prized for their unique properties, including natural resistance to pests and decay. Examples are teak, mahogany, ebony, rosewood, and ipe.

Exotic or Non-Native Woods: a wide range of wood species from various regions around the world. These woods often possess unique grain patterns, color, and characteristics that make them highly sought after for specialty projects and woodworking. Examples of non-native woods include zebrawood, padauk, wenge, purpleheart, and bubinga.

Bamboo: technically a grass, bamboo has properties similar to wood and is known for its exceptional strength-to-weight ratio, making it an excellent material for a wide range of applications, including flooring, furniture and construction.

In terms of wood product, FAO has produced a classification of wood and wood products for use in international trade and national and international wood sector statistics. See Annex A4.[21]

7.5.3 Wood production and trade trends

The International Tropical Timber Organization (ITTO) produces a biannual review and the assessment of the world timber situation.[22] The most recent edition, covering 2021-22, shows that:

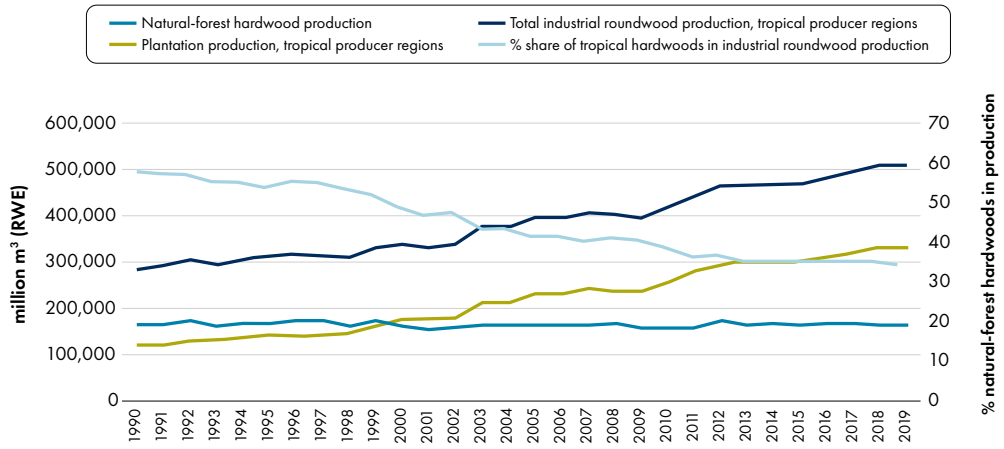
- Sawnwood accounts for almost 50% of international wood trade by volume, closely followed by roundwood. Exports from tropical countries account for 10% in both categories.
- The most valuable commodity in international wood trade by unit value is veneer, closely followed by plywood.

[21] Other categories are for various forms of paper and cork.
[22] See [109]. Unless otherwise stated, all data and information in this section is from this report. 2019 data is used in the discussion above because of Covid-related data weaknesses for 2020.

FOREST PRODUCTS

- Exports of roundwood and sawnwood from Africa account for less than 4% of world trade by volume but have the highest unit value.

The ITTO 'Biennial Review and Assessment of the World Timber Situation' includes data on the major tropical species imported and exported by each member state as logs, sawnwood, veneer and ply, with data on the traded volumes and prices where available. Preferred species vary between end markets, with Asian markets tending to import a wider range [4].The trend since 1990 is for an increasing share of tropical roundwood to be sourced from plantations [54].



Source: ITTO (2020), corrected for pulplogs and plantation volumes in Southeast Asia.

Figure A5: Total and natural-forest industrial roundwood production in tropical producer regions, 1990–2019

A veneer plant in Mozambique. Veneers are thin sheets of wood of uniform obtained by sawing, slicing or peeling (rotary cutting).

Up to 2050, Europe and the Americas are expected to continue to be the principal sources of supply of internationally traded wood, accounting for 67% in 2020. However, planted forests in sub-Saharan Africa, Latin America & the Caribbean, South-eastern Asia, Southern Asia, Eastern Asia are expected to provide an increased supply from additional planting and improved productivity [2].

FOREST PRODUCTS

Table A6: Summary table of main trends in the industrial roundwood (IRW) supply by forest category [2]

	Share of industrial roundwood production 2020	Trends in potential supply to 2050
Naturally regenerated tropical and sub-tropical forests (sub-Saharan Africa, Latin America & the Caribbean, South-eastern Asia, Southern Asia)	9%	• Historically, supply from these forests has been stable. • Growing stock in naturally regenerated forests is expected to further decline. • Priority is given to conservation and maintenance of ecosystem functions. • Suitability of tropical species in modern wood products is limited due to technical specifications and/or costs of production.
Planted forests tropical/ subtropical (sub-Saharan Africa, Latin America & the Caribbean, South-eastern Asia, Southern Asia, Eastern Asia	23%	• Growing contribution to global IRW supply. • Large potential for productivity increases in existing planted forests. • Regional forest landscape restoration pledges of more than 200 million ha offer possibilities to restore areas for IRW production with commercial exotic and indigenous species. • Large areas of agroforestry and tree crop plantations (45 million ha) already contribute to IRW supply, though the actual contribution to global IRW (and fuelwood) production is unknown. Agricultural area expansion offers opportunities to enlarge this resource base.

Competing technical and market factors that will affect the extent of demand for new plantations in emerging markets over the coming decades include the pace at which sawmill and plymill wastes are used efficiently to substitute for virgin wood; the pace and scale of substituting wood for non-renewable resources, e.g. in construction; the rate of productivity increase in plantations, and the as yet unknown impacts of climate change on plantation productivity, e.g. from effects of fires, wind, thermal and water stress [2] [55].

FOREST PRODUCTS

Table A7: Leading countries for production, consumption and export of tropical wood [4]

	Production	Consumption	Export
Logs	Indonesia India Vietnam Brazil Thailand	Indonesia India Vietnam Brazil China	Papua New Guinea Brazil Cameroon Rep. of Congo Mozambique
Sawnwood	India China Vietnam Thailand Brazil	India China Vietnam Indonesia Brazil	Thailand Malaysia Brazil Cameroon Gabon
Veneer	Vietnam Indonesia China Gabon Brazil	China Indonesia India Vietnam Philippines	Vietnam Gabon Thailand Myanmar Indonesia
Ply	China India Indonesia Vietnam Malaysia	China India USA Japan Vietnam	Indonesia Vietnam Malaysia China Brazil

7.5.4 Principal LMIC producing, consuming and exporting areas

ITTO data [4] shows that amongst the lower and middle-income countries, Asia-Pacific dominates production, consumption and export of roundwood, sawnwood, veneers and ply with the only other country regularly in the top five being Brazil. In Africa, Cameroon, Republic of Congo and Mozambique are major exporters of logs; Cameroon and Gabon of sawnwood, and Gabon of veneer.

7.5.5 Wood sector investment

Estimates of the global level of investment needed in the forest sector are subject to policy factors including efforts to prevent deforestation and protect biodiversity. One set of estimates published by FAO for the thirty years 2020-2050 indicate the following needs:

- average annual investment globally in natural forests amounting to US$393 billion up to 2055 in scenarios that gradually optimize carbon sequestration benefits while providing timber to the markets;
- average annual investment in new and restored plantation forests of approximately US$16 billion to meet a total expected plantation forest area increased to 161 million ha.
- average annual investment need of US$25 billion per annum from 2020 to 2050 in the wood industry sector, for new production facilities and two fifteen-year cycles of modernisation, replacement and upgrading of existing equipment.
- The investment cycle for plantations averages 12 years; sawmilling and ply, 30 years. Rough estimates of cost, recognising that actual costs vary widely, are US$1,200/ha. plantation and US$200/m3 roundwood equivalent (RWE) intake for saw and ply mills [2].

FOREST PRODUCTS

Wood supply and processing are expected to continue to move from industrialized to emerging markets over this period [2]. Little quantitative information is available on the investments made in the sector, but the following patterns are observable.

- Much forest sector investment is still in developed economies.
- There are small funds seeking to identify emerging market opportunities in Latin America, Asia and Africa, and a proliferation of nature-based carbon project platforms, developers and financiers with projects in developed and in emerging markets [56].
- Experience from sustainability-focussed investment funds indicates that the key types of project being developed are:
  - Establishing and rehabilitating plantation forests
  - Harvesting from natural forest
  - Sawmills and wood processing into ply and boards; production of posts and poles, secondary processing into products such as flooring or furniture.

7.6 Forest Carbon

Note that MFF has published (March 2024) a guide to available tools for climate-focused investors to Estimating Carbon in Forestry Investments, which can be found online.

7.6.1 Introduction to carbon markets

Carbon markets are trading systems where carbon credits are bought and sold. Projects that target the removal of greenhouse gases (GHG) from the atmosphere use a carbon methodology to calculate the number of tonnes of CO2 equivalent[23] emissions the project activities have sequestered or avoided. Once carbon credits are generated, they are stored in carbon registries. It is through these registries that credits are issued, traded and, when used by a buyer to offset carbon emissions, retired. Once a credit is retired it cannot be traded again.

There are two types of carbon markets – compliance and voluntary.

Compliance carbon markets are where governments set a limit on carbon emissions, with entities emitting less carbon able to sell their excess allowance, as carbon credits, to those emitting over their allowance. Carbon credit prices are largely driven by government policy, and vary, e.g. the European Union Emissions Trading Scheme (ETS) saw prices rise above €100 (US$109) per tCO2 in March 2023, whilst the China National ETS and Republic of Korea ETS were closer to US$10 per tCO2 [5]. 40 countries and more than 20 cities, states and provinces already use carbon pricing mechanisms which together cover about 13% of annual global GHG emissions [57].

Voluntary carbon markets allow the issuance, buying and selling of carbon credits on a voluntary basis. These markets can be either national or international and can be used by companies to offset their emissions. The voluntary carbon market reached US$2 billion in 2021, which was four times the value of the previous year. A variety of different types of projects can generate credits for the voluntary carbon market, relying on certification e.g. by VCS or Gold Standard, to verify the emission reductions.

An alternative to a compliance carbon market that also places a price on carbon is a carbon tax, which defines a tax rate on carbon emissions or, more commonly, on the carbon content of fossil fuels. This approach does not cap emissions directly but aims to make carbon emissions sufficiently expensive and therefore reduce them indirectly.

[23] Not all GHG are CO2. Methane (CH4) and nitrous oxide (N20) for example are also GHGs, and different gases have different global warming potential (GWP) i.e. their ability to trap heat varies. The difference between the GWP of each gas and the GWP of CO2 is used to convert all GHG emissions into a CO2 equivalent (or CO2e) therefore allowing all types of GHG emissions to be aggregated.

FOREST PRODUCTS

7.6.2 Forest carbon opportunities

In relation to forests, there are carbon credit programmes relating to emission reductions and to sequestration.

- For emission reduction, credits can be generated for avoided deforestation, i.e., reducing deforestation and forest degradation (REDD+).
- For carbon sequestration, credits can be produced for afforestation, reforestation, restoration (ARR); soil sequestration; biochar production and wetland restoration.

Credits from different forest-related activities have different values. Those generated through ARR projects are generally worth more than those generated through REDD+ projects. Unlike wood, the carbon credit market is not transparent and price data is limited.

Recently there have been concerns raised about the integrity of credits traded through the voluntary markets. See Section 7.6.4 for more information about carbon integrity.

7.6.3 Carbon Harvesting Models

There are a number of different methodologies for modelling carbon sequestration or emissions reductions depending on the certification sought and the activities undertaken by a project. A carbon sequestration model for forestry-related projects calculates the amount of carbon stored in above and below ground biomass of live trees, dead wood, leaf litter, soils etc. This is a highly technical process and all carbon projects should have access to carbon modelling expertise.

Table A8: Forest carbon types and characteristics

ARR Planting trees (either in natural forests or plantations) and restoring natural forest.	Requires a high level of investment upfront, with at least 3-5 years before the first issuance of credits (as the trees grow large enough to sequester significant carbon), with then a steady stream thereafter.
REDD+ Can include avoiding planned deforestation, e.g. if the area is a timber concession and is protected rather than logged; or preventing unplanned deforestation e.g. by protecting forest against illegal logging	Generally require lower investment at the start than ARR projects and can begin generating credits from the moment activities start, leading to a cashflow from carbon relatively quickly.
Improved forest management Earn credits by implementing sustainable forest management practices	Implementing activities such as extending rotation lengths, improving forest productivity by thinning diseased trees, managing non-native species etc.
Wetlands Restoration and Conservation (WRC) Either restoring wetlands and thereby increasing GHG removals, or reducing GHG emissions through rewetting and/or conserving wetlands. Wetlands include some forest types e.g. mangroves, peat swamp forest, and wet floodplain forests. Also known as blue carbon.	Similar to REDD+ projects, WRC projects can begin generating credits from the moment activities start. There is the potential for significant carbon credit generation through WRC projects since wetland forest ecosystems store significant amounts of carbon. Mangroves, for example, store more carbon per unit area than any other ecosystem on Earth [58]. Some WRC projects can use REDD+ methodologies.

FOREST PRODUCTS

It is important for forest carbon projects to demonstrate additionality and take into account leakage and permanence. The methodologies for additionality, leakage and permanence are complex (see 11.6.2).

- Additionality - the emissions reductions or carbon sequestration achieved by a carbon offset project must be additional to what would have occurred in a business-as-usual scenario.
- Leakage - emissions reductions in one location or sector resulting in increased emissions in another location or sector.
- Permanence - the long-term stability and durability of carbon reductions or carbon sequestration.

Other factors that are key for carbon integrity are covered in 7.6.4.

For plantations, the trees are never intended to be permanent. To address this carbon accounting methodologies for plantations take into account the use of the trees after harvest. In the most conservative scenario, all stored carbon is assumed to be emitted following harvest, and the model takes the average carbon stock for the lifetime of the plantation as the maximum volume of credits that can be issued. Where timber is destined for construction or similar industries where it is likely to retain a proportion of the stored carbon, the maximum volume of credits can be higher.

7.6.4 Carbon Integrity

Recently the integrity of both carbon credits coming onto the market and the organizations purchasing credits to offset emissions has come into question [59]. As a result, carbon integrity policies are being developed by buyers, sellers, and investors.

- For buyers the policy should cover the integrity of the credit suppliers, with organizations such as The Integrity Council for the Voluntary Carbon Market (ICVCM) developing the Core Carbon Principles (CCP) [60] which outline the minimum expectations for a credible carbon project. The principles cover effective governance, tracking, transparency, robust independent third-party validation and verification, additionality, permanence, robust quantification of emissions reductions and removals, no double counting, sustainable development benefits and safeguards, and contribution towards net zero transition. Carbon certification standards can be assessed by ICVCM and approved as CCP-Eligible.
- For sellers (including carbon-generating projects) a carbon integrity policy should consider the carbon credit buyer. Clients buying credits should have a carbon strategy that first aims to reduce emissions, with offsetting via carbon credits reserved only to neutralize the unabatable (~10%) residual emissions. Transparency regarding buyer emissions and a prohibition on selling to companies whose activities are not aligned with a credible climate strategy would also enhance the integrity of the buyer. Initiatives such as the Voluntary Carbon Markets Initiative (VCMI) has developed a code of practice for organization making claims related to carbon offsetting.
- For investors the integrity of both projects (suppliers) and buyers is of potential interest. Best practices for forestry investment models with a carbon credit element are Carbon Credit Integrity Policies that address both the supply and demand side integrity.

Carbon certifier Verra has recently taken steps to make the VCS standard more robust and address concerns raised about credit integrity [61]. VCS and Gold Standard are currently under assessment by ICVCM for CCP-Eligibility. For more information and further guidance regarding carbon integrity see Implementing Approaches to Carbon Credit Integrity: A practical guide for impact-focused investors [62]

FOREST PRODUCTS

7.7 Other payment for ecosystem services schemes

Carbon credits are the most well-established type of payment for ecosystem services (PES), however they are not the only type of environmental credit available. Others include biodiversity credits, payments for water quality and quantity and other ecosystem services.

7.7.1 Biodiversity Credits

Biodiversity credits are a market-based mechanism aimed at incentivizing and compensating actions that enhance biodiversity conservation and ecosystem restoration. Similar to carbon credits, biodiversity credits are units of measurement representing the conservation or restoration of biodiversity within a specific area or ecosystem. Biodiversity credits could play a significant role in achieving global commitments, such as conserving at least 30% of the planet by 2030, and are specifically listed by the Convention on Biological Diversity as a method to mobilise the funding needed [63].

The process typically involves quantifying the biodiversity benefits generated by conservation or restoration actions, such as the protection of endangered species habitats or the restoration of degraded ecosystems. These benefits are then verified and certified by third-party certification bodies such as The Global Biodiversity Standard [64], Plan Vivo's PV Nature [65], Verra's SD VISta Nature Framework [66], The Organization of Biodiversity Certificates [67], and Gold Standard for the Global Goals[24] [68].

A range of biodiversity credit markets are emerging, however in comparison with carbon markets, these are embryonic. They include voluntary or philanthropic credits, biodiversity-enhanced carbon credits (e.g. CCB certified carbon credits with gold level biodiversity benefits), beyond value chain biodiversity credits[25], and national compliance offset programmes. Businesses can also use insetting rather than offsetting, where the focus of biodiversity benefits is within their own operations or value chain resulting in insetting credits or claims. The biggest volumes are currently within national compliance programmes. Collectively biodiversity offsets and credits are currently mobilising between US$6 and US$9 billion annually [69].

However, similar integrity challenges exist to those within carbon markets, e.g. accurately quantifying biodiversity benefits, ensuring transparency and accountability in credit trading, and addressing potential concerns regarding additionality, permanence, and leakage. An additional challenge with biodiversity credits is the absence of standardized frameworks, metrics and reporting requirements for assessing biodiversity impacts [70].

7.7.2 Other PES schemes

Water quality and quantity certification schemes have been available for a decade or more, e.g. the Gold Standard Water Benefit Certificates [71] which represent quantified and certified impacts to securing access to water.

FSC has developed a procedure to allow FSC-certified forest managers to demonstrate the positive impacts of their activities on a specific subset of ecosystem services in a process that is assessed alongside general FSC audits [72] [73]. The ecosystem services assessed by FSC are carbon sequestration and storage, biodiversity conservation, watershed services, soil conservation and recreational services. Impacts on one or more of the ecosystem services may be claimed.

[24] Gold Standard for the Global Goals allows projects to quantify and certify their impact toward achieving the Global Goals which include biodiversity targets. All projects must demonstrate climate benefits. See 12.6.4 for more details.

[25] These credits go beyond a company's negative biodiversity impact and contribute to positive biodiversity gains to achieve global biodiversity goals.

THE IMPACT PROPOSITION

8.1 Summary of potential positive impacts of forestry investments

This section explores the potential environmental and social benefits of investments in the forestry sector. More information about materialized, measuring and reporting impacts can be found in Section 12.

Projects are generally large-scale and therefore environmental impacts, particularly those related to climate and biodiversity can be significant. The restoration of forests (either natural or plantations) is considered to be one of the most effective ways to mitigate climate change [74]. Social impacts are primarily through employment or improvement of livelihoods, although there are additional potential benefits e.g. related to capacity development or infrastructure creation. Finance can also flow directly to communities through land lease payments or carbon credit benefit sharing agreements where community land is used for credit generation (benefit sharing agreements should be transparent, agreed with communities and may not always include cash payments).

Positive impacts, of all projects not just forestry, can be challenging, and potentially costly, to measure. Where it is possible to monetize impacts (e.g. through carbon credits) then these schemes can cover the cost of thorough monitoring.

Impact related incentive structures are being explored within the sector, where financial incentives are used by investors related to impact generation. These incentives could include lower interest rates for high performing projects, or impact-related performance fees for funds which are only paid when impacts reach pre-determined targets. For example, a USD200 million African Forestry Fund has recently announced an Impact Target structure, whereby 20% of calculated carried interest is directly related to the outcome of four impact targets across the themes of climate, biodiversity, gender, and community and livelihoods [75].

8.2 SDGs and forestry investments

Forestry investments have the potential to contribute towards many of the SDGs. Opportunities for impacts on goals such as gender equality, reduced inequalities, and responsible consumption and production are similar to those of other large-scale projects where ESG risk are managed well e.g. through recruitment processes, well-designed community engagement and responsible waste management. Table A6 outlines the potential contribution of different types of forest-sector investments to the SDGs.

8.3 Impacts through Sustainable Forest Management

The SFM concept emerged in the 1990s as a framework for achieving benefits through improved management of forests to optimize both commercial and positive impact outcomes. SFM, either of plantations or natural forest, can generate multiple benefits.

Environmental benefits could include:

- Conservation of forest ecosystems, and protection of the services they provide;
- Climate change mitigation;
- Reduced erosion;
- Improved water quality; and
- Biodiversity conservation.

Social benefits could include:

- Livelihood benefits including job creation;
- Community development through supporting access to basic services such as education, healthcare and infrastructure;
- Protection cultural and spiritual values;
- Protecting the rights of Indigenous Peoples; and
- Recreation and leisure.

THE IMPACT PROPOSITION

Table A9: Forest sector projects and their potential contributions to SDGs

SDG	SFM of plantations: planted areas & set aside areas	SFM of Natural Forests	Forest-based carbon: protection or reforestation of native forest
	Projects with well-designed smallholder outgrower schemes may contribute to reducing poverty. Employment may raise incomes.	Some stable, long-term and temporary employment opportunities, generating income. Maintenance of the ecosystem services provided by a healthy forest can support the broader community provided access to the forest is maintained.	Livelihood activities as part of REDD+ projects can generate incomes for local communities. Benefit sharing agreements may also provide some income to communities.
	Well-designed projects, with appropriate site-species matching, can help regulate and improve water availability and quality through reducing erosion and runoff, and facilitating ground water recharge.	Well-managed forests can play a significant role in water catchments, both for water quality and quantity.	Forest protection is important to protect water catchments and can have benefits in both water quality and quantity.
	Significant employment opportunities, with labor requirements changing across growth stages. Employment is a mix of temporary and permanent.	Labor requirements are more consistent than for plantations. Employment is a mix of temporary and permanent.	Employment opportunities generally related to patrolling for forest protection or through livelihood programmes.
	Carbon emissions reduction through carbon sequestered and stored by trees. Emissions reductions increase as trees mature. Set aside and restored areas also sequester and store carbon. Note: carbon accounting methodologies for credits take account of the use of timber, i.e. whether short term for biofuel or pulp, or longer term, e.g. in construction or furniture.	Carbon emissions reductions due to improvements I forest management due to SFM. These can be calculated through carbon accounting methodologies.	REDD+ projects have the potential for significant carbon mitigation from the very start of the project (depending on the baseline) since mature trees sequester and store more carbon than newly planted saplings. ARR projects will slowly increase carbon emissions reductions as saplings grow to maturity.
	Biodiversity impacts of plantations are generally limited to set aside areas (particularly HCV areas), however the value of these areas as wildlife corridors should not be underestimated. In addition, improved security across the site can reduce activities such as illegal logging, illegal hunting and trade in threatened species.	Significant biodiversity impacts can be expected in areas of natural forest, however harvesting timber, even with SFM techniques, causes some level of disturbance which may impact some species.	Significant biodiversity impacts can be expected in these projects, with those for REDD+ projects more immediate that those for ARR projects, however biodiversity impacts of ARR projects will grow over time and have the potential to demonstrate greater change than REDD+ projects.

THE IMPACT PROPOSITION

8.4 Climate benefits (mitigation, adaptation and resilience)

Protection of forests and planting trees can generate significant climate benefits including mitigation, adaptation and resilience.

Climate mitigation:

- Forests are carbon sinks, with trees sequestering carbon from the atmosphere and storing it as they grow. Land use change, principally deforestation, accounts for between 12% and 20% of global annual GHG emissions [76], so protecting forests from further destruction can have substantial impacts on GHG emissions.
- Plantations and natural forest restoration/afforestation projects sequester and store small amounts of carbon when young, and this amount steadily increases at the trees mature. Where plantation products are for short term use (e.g. pulp and paper, biomass for energy), carbon storage is considered to be temporary. This is taken into account in carbon accounting for certification. Recent research [77] has quantified the climate mitigation potential of different management practices in forest plantations.
- Trees, either from natural forests or plantations, provide a renewable source of timber and biomass, which can be a substitute for fossil fuel intensive products and energy, reducing carbon emissions in comparison with alternatives.

The volume of carbon sequestered depends on a number of factors including tree species, age, growth rate, soil type and management design (e.g. rotation cycle). When considering the use of wood in the long-life products, e.g. as a construction material, carbon is not only captured in the timber, but is also reducing emissions from the production of the materials, e.g. steel and concrete, which the timber is replacing.

Adaptation:

- Enhanced Water Management: see table A9 above on impacts contributing the SDGs.
- Soil Protection: tree plantations help prevent soil erosion, can enhance soil fertility (depending on the species mix), and improve the overall health of landscapes. This protection helps to maintain soil moisture, benefitting agricultural productivity and ecosystem resilience in the face of climate variability.
- Biodiversity: forests can act as climate refugia for wildlife due to their microclimates (see Section 6.5.1).

Resilience:

- Biodiversity Conservation: see table A9 above on impacts contributing the SDGs.
- Sustainable Land-use Practices: plantation forestry can promote sustainable land-use practices by preventing deforestation, limiting land degradation, and offering an economic alternative to destructive activities like slash-and-burn agriculture. By reducing pressure on natural forests, plantation forestry helps preserve their resilience and ecosystem services.

8.5 Employment opportunities and local economic benefits

Large-scale forestry investments have a number of social and economic benefits, including:

- Employment opportunities: see table A9 above on impacts contributing the SDGs.
- Alternative livelihoods: REDD+ carbon projects must demonstrate how activities undertaken by the project are reducing deforestation. One option is to develop alternative opportunities for local communities who previously have generated an income through activities that cause deforestation or forest degradation e.g. charcoal

THE IMPACT PROPOSITION

The impact of improved road and transport links due to forestry related investments is often unrecognized or under evaluated

production. These livelihood activities, e.g. development of agroforestry plots, requires capacity development and often project support in the form of inputs. In some instances projects can help groups of farmers to form cooperatives to support processing and sale of produce.

- Skills development and capacity building: forestry investments often involve training programs to enhance the skills and knowledge of local communities. This can improve their employability not just within the forestry sector but also in other related industries. There is an increase in service providers specializing in upskilling forestry related employees e.g. Field Ready [78]
- Land lease payments and benefit sharing arrangements can provide valuable incomes to local communities, however, this needs to be managed carefully and transparently (see Section 14). REDD+ carbon projects certified to CCB must develop a transparent and fair benefit sharing mechanism with effective participation of stakeholders.
- Value Chain opportunities for timber products and NTFP's: an increase in income generation opportunities across the forestry value chain (nurseries, seed collection) and NTFP's.
- Infrastructural development and road improvement: the impact of improved road and transport links due to forestry related investments is often un recognized or under evaluated. These impacts may be enhanced through revenues paid to local and national governments. A study on the socio-economic contributions of a large-scale plantation forest in Sierra Leone revealed that the most crucial contribution perceived by the investment was the improvement in road conditions followed by employment creation. A project in Nigeria saw a 30% increase in market value of commodities (Kola Nut and Cocoa) due to the improved road network.

THE IMPACT PROPOSITION

- Knowledge sharing and transfer: large-scale forestry investments involve knowledge sharing and transfer from international experts to local communities. This builds local capacity and promotes the exchange of ideas, techniques, and best practices related to sustainable forest management. In Ghana, Uganda, and Tanzania, there are examples of the creation of new contracting businesses that have been bred from the industry, often by previous employees branching out and specializing in service provision for forestry and agriculture.

8.6 No net loss versus net positive impacts on biodiversity

"No net loss" and "net positive impacts" are two approaches to address the potential loss of biodiversity due to project activities [79]. Both approaches initially seek to reduce impacts on biodiversity as much as possible.

- The "no net loss" (NNL) approach requires that any biodiversity or habitat that is negatively impacted or lost due to project activities is compensated for by at least an equivalent amount of biodiversity or habitat of a comparable type being conserved or restored elsewhere, thereby preventing a net decrease in biodiversity as a result of the project.
- The "net positive impacts" (NPI) approach goes beyond NNL, by requiring a net increase in biodiversity or habitat quality compared to baseline conditions. The goal of NPI is to enhance the natural environment and biodiversity, not merely avoid declines. NPI is equivalent to "net gain".

For both approaches, a mitigation hierarchy should first be applied, with negative impacts on biodiversity avoided as much as possible, then remaining impacts minimized and only those remaining offset.

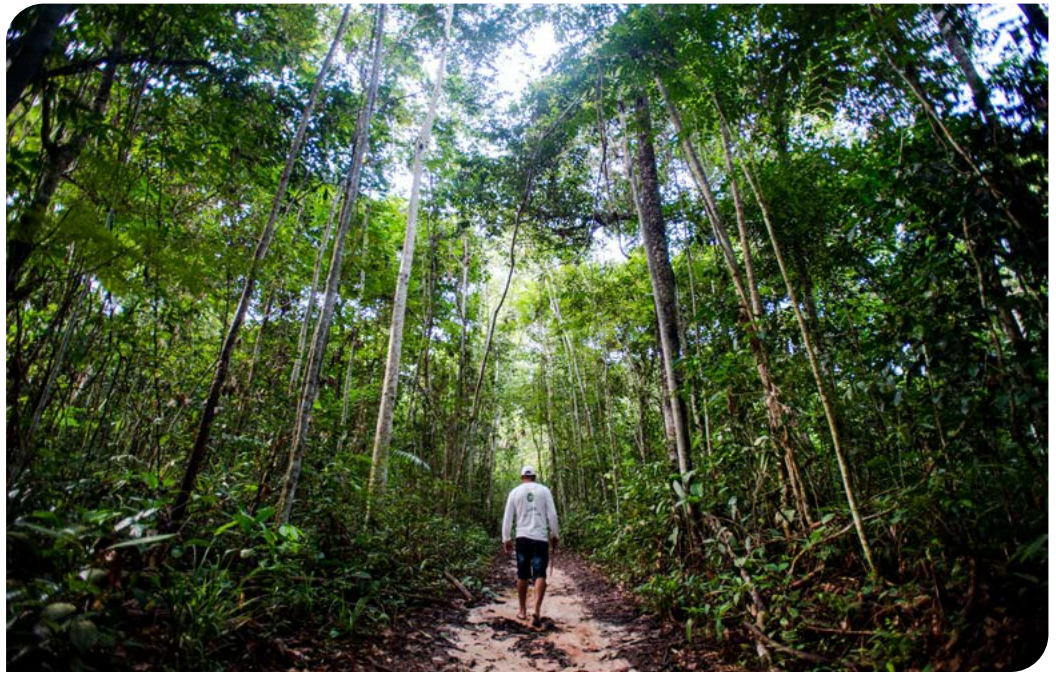


Image courtesy of Partnerships for Forests

As explained in Section 13.6, IFC PS-6 requires NNL (where feasible, and ideally NPI) for all natural habitat and NPI for critical habitat. In contrast, FSC requires HCVs and sample representative ecosystems to be "maintained or enhanced", alongside no conversion of natural habitat. CCB requires projects to demonstrate NPI on biodiversity.

COMMERCIAL PERSPECTIVES

9.1 Forest products: wood

9.1.1 The investment case

The investment case for projects in the forest sector can be based on a range of factors.

- Timber Production: well-managed forests can provide a steady supply of timber to meet national and global demand.
- Long-Term Asset: forests are long-term assets that appreciate over time as trees grow and mature.
- Resilience to Economic Cycles: the demand for timber and wood products tends to be less affected by economic downturns compared to other industries and there is some flexibility in harvesting schedules compared, for example, to agriculture or agro-forestry that have fixed harvest schedules.
- Ecosystem services: sustainably managed forestry projects can provide ecosystem services and protection or restoration of natural forest may be eligible for government incentives and grants.
- Local Employment: forestry investments can create jobs in rural and less developed areas, contributing to local economic development and improving livelihoods.
- Productive forests: either natural forest logging or plantations can provide alternative sources of forest products and livelihoods, this may have a secondary impact of reducing pressure or loss of natural forests.
- Carbon credits: an additional revenue stream could be the generation of carbon credits. See Sections 7.6 and 9.2.

For a detailed discussion of potential environmental and social benefits from forest sector investments see Section 8.

9.1.2 Key Commercial Risks

The key commercial risks relate to costs; production; markets; legal, governance and reputational issues.

- Underestimated costs, especially for land acquisition and compensation, e.g. where land is leased from communities who realize during the process that their land has greater value than they initially thought and land leases are renegotiated. Other unforeseen and fluctuating costs for logistics e.g. rising cost of rail, blockages in ports.
- Production risk, e.g. survival rate of planted trees not matching modelling; unexpected pests and diseases; recovery rate (logged tree to end-product ratios) different to modelling; limited availability of machinery, spare parts and quality maintenance.
- Market risk, e.g. not all customers require FSC certification and are unwilling to pay a premium price for certified products; market saturation, e.g. if several projects targeting domestic markets reach maturity at the same time; change in demand in the interval between planting and processing, e.g. plantations that have shifted from production of poles to production of veneers to adapt to changed market conditions between project planning and harvest.
- Reputational, legal and governance risks, e.g. where there is any relocation; delays in getting permits and licences; corruption; certifications required by some customers or investors, e.g. CE product certification for EU markets;[26] ISO quality and environmental management certification.

[26] The Construction Products Regulation (CPR), Regulation EU 305/2011, came into force across the EU on 1 July 2013 to ensure that construction products placed on the EU market are "fit for purpose". The Regulation applies to timber and timber-based products destined for the construction sector that are covered by a Harmonised European Standard (hEN) or a European Technical Approval (ETA). This is a legal requirement and applies to manufacturers, importers, or distributors of such products placed on the market and traded in the UK and Europe. See [110].

COMMERCIAL PERSPECTIVES

- Long tenure. Forest sector investments generally require a long time before they become profitable requiring patient capital or long tenure loans.
- Political risk, e.g. where political instability or corruption affects the ability to harvest or export, or where markets are based on government spending or donor commitments, e.g. poles for electrification projects.

9.1.3 Overlap between commercial and ESG risks and impacts

Commercially successful forestry projects can bring significant local direct and indirect employment and provide people with marketable skills. They can make a significant contribution to forest protection and the related biodiversity and ecosystem service benefits, including relieving pressure on natural forests and ecosystems. Depending on the tax regime, forestry projects can generate significant revenues for government from taxes on timber production, royalties on forest resources, and income taxes from forestry-related businesses; customs duties and levies; land use and concession fees. Revenues may flow to national, regional or local authorities.

Poor ESG performance can negatively impact the commercial performance of projects.

- Inadequate social assessment and community engagement, especially in relation to land rights (formal and informal), can lead to disputes, renegotiated leases and higher than expected costs.
- Loss or non-issuance of environmental permits is costly and can stop work.
- Lost sales where customers require evidence of good ESG performance, e.g. from certifications to FSC, Chain of Custody, ISO 9001, 14001, 45001.
- Strikes and work stoppages are more likely and frequent when employees are not well managed.

Box A11: Example of the importance of applying HR best practices

A plantation company in Sub-Saharan Africa did not invest in HR capacity, following very minimal national requirements and not aligned with IFC PS, leading to an unsettled workforce whose voice was not being heard, and an internal grievance mechanism that did not work. This resulted in strikes and work stoppages during the planting season, which in turn resulted in loss of planting time, death of seedlings, and a failure to meet planting targets. Employees also included local government, resulting in a contentious relationship between the company and the local government that persisted for a few years. Together these issues were very costly to the company.

To remedy the situation, the company invested in HR capacity, developing clearer, and more culturally acceptable communication channels, including monthly HR meetings with all teams. Following the implementation of these measures the relationship improved and grievances were dealt with early and appropriately.

COMMERCIAL PERSPECTIVES

9.2 Commercial perspective on forest carbon

9.2.1 The investment case for forest carbon

The investment case for forest carbon varies depending on whether credits are earned through avoiding emissions or from carbon sequestration, and on whether the project is solely a carbon project or a combined wood/carbon project.

- For avoided emissions: REDD+ projects are one of the few ways to channel commercial funds into forest protection and to generate a financial value for standing forest. Emission reductions can be calculated from the moment project activities begin, and resulting carbon credits can therefore be generated quickly. However, where REDD+ projects avoid unplanned deforestation[27] the timeframe may be extended because prior to generating credits they generally require extensive community engagement, and possibly the development of alternative livelihoods to support communities to secure sufficient income from already deforested land, and increased patrolling to reduce and monitor illegal activity.
- For carbon sequestration: Projects that involve planting trees (whether as part of natural restoration or a plantation) require considerable up-front financing with carbon sequestration slowly increasing over time as the trees mature. However once mature, a steady stream of carbon credits can be expected. Tress within an area of natural forest regeneration will reach maturity more slowly than plantation trees, resulting in a slower increase in credit generation in the early years. In addition, these credits are generally more valuable than REDD+ credits.
- Where a project includes both areas of natural forest and greenfield plantations, REDD+ (if available) can provide an early income flow from the natural forest while the plantation area is growing and before it yields income.

Brazil nut tree - Image courtesy of Partnerships for Forests

9.2.2 Overlap between commercial and ESG risks and impacts for forest carbon

The key overlaps between commercial and ESG risks for forest carbon relate to social (community) impacts. A focus on GHG aspects alone can lead to neglect of potential negative social impacts such as reduced access to forest resources, switch in land use from food to trees, which can then lead to commercial risk from objections, protests and incursions. Conversely, projects that exhibit high levels of social performance including stakeholder engagement and effective benefit sharing can mitigate these risks and also receive higher prices for the carbon credits generated.

[27] Unplanned deforestation is generally localized, caused by illegal activities or local people clearing forest for small-scale agriculture. Planned deforestation, in comparison, is generally large-scale and undertaken by commercial organizations with legal permits for clearing land for alternative activities such as cattle ranching or palm oil plantations.

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PART B
ESG CONSIDERATIONS

This section of the guidance looks specifically at ESG considerations related to investments in the forest sector. It focusses on aspects that are specific to the sector in order to guide investors as to particular considerations for forest sector investments. These aspects are in addition to the general ESG considerations for investments in any sector which are not covered here.

- *Section 10 provides an overview of the particular ESG considerations relevant to projects in the forestry sector,*
- *Section 11 focusses on certification standards,*
- *Section 12 discusses positive impacts,*
- *Sections 13-15 provide more detailed information on environmental, social and governance risks and mitigation.*

UNDERSTANDING ESG IN THE FOREST SECTOR

10.0

Many ESG considerations for forest sector projects are similar to those for large projects in other sectors such as agriculture or infrastructure. Projects require, in most cases, a comprehensive social and environmental impact assessment, and all require an environmental and social management system (ESMS) that addresses the project's regulatory requirements, risks and impact opportunities and ensures that sufficient human and budgetary resources are in place. Issues of labor and working conditions, pollution control and resource efficiency, community health, safety and security, and land acquisition are largely similar to those found in agriculture and infrastructure projects. ESG aspects of wood processing are broadly similar to those of metal or meat processing. As with most projects regardless of sector, best practice includes building adaptive management into operational processes with regular monitoring, evaluation and adaptation.

Bia-juabeso-landscape - Image courtesy of Partnerships for Forests

Sustainable forest management (SFM) is considered best practice for forestry sector projects and can be applied to both natural forest management and plantations. Section 7.3 gives an overview of SFM.

Forest sector projects in low- and middle-income countries often interface with Indigenous Peoples, and if so, may need to consider a diligent approach following an Indigenous Peoples plan and processes for free prior and informed consent (FPIC). This could be done in alignment with e.g. IFC PS-7.

In addition, forest sector projects share some characteristics that are particular to the sector and give rise to specific ESG considerations.

- **Scale** – forest projects, whether for harvesting from natural forest, plantations or forest carbon, tend to cover very large areas of land, frequently in the tens of thousands of hectares. This brings specific challenges particularly with respect to remote working, security and monitoring. Projects spanning large areas of land may have many community stakeholders and a range of different local authorities and agencies to engage with. In addition, the large scale of these projects means that project activities potentially have

UNDERSTANDING ESG IN THE FOREST SECTOR

significant interactions and impacts on the broader landscape, e.g. impacts on water availability can have wide-reaching impacts on all areas downstream of the project site.

- **Timescale** and the need for adaptive management – forests take longer to grow than most agricultural crops. Plantations in new areas may change end products, e.g. from poles to veneers, if factors such as tree growth, quality, logistics or market conditions change. Forest carbon projects based on afforestation/reforestation also take several years to generate carbon credits, although revenue from carbon may be generated earlier when credits are pre-sold. From an ESG perspective a long period to profitability can put pressure on ESG budgets and slow delivery of social and environmental commitments. For the forest sector in particular it is important that ESG budgets and resourcing are hard-wired into project financial models.
- **Diversity** – forest sector projects range from the relatively simple (logging and sale for further processing) to those having multiple components including large-scale and smallholder plantations, forest conservation, carbon credits, ecosystem services, primary and secondary processing.
- **Importance of certification** – the forest sector is unusual in the importance of sector-specific voluntary certifications in establishing ESG performance standards and in the marketplace. FSC and PEFC set ESG standards for wood and wood products that are widely recognized in the marketplace. For carbon, VCS, CCBA and Gold Standard are internationally recognized standards in the voluntary carbon market. Best practice is that projects should build certification into their business models, however it is important to note that there are gaps between the requirements for these certifications and compliance with IFC PS (e.g. approach to biodiversity) which are outlined in Section 11. These certification standards change more frequently than the IFC social and environmental performance standards. Investors and project sponsors must keep abreast of changes in certification requirements and methodologies, e.g. revised REDD+ methodologies under development in mid-2023. Carbon project integrity can be further strengthened by using certification schemes that meet carbon integrity criteria such as the Integrity Council for the Voluntary Carbon Market (ICVCM) Core Carbon Principles.
- **Supply chain regulations** to prevent deforestation – under the new EU Regulation on Deforestation Free Products (EUDR) [9][28] controls will be applied to wood and wood products on the EU market from 30 December 2024. EUDR sets mandatory due diligence rules for businesses that place wood and wood products on the EU market, or export them from the EU, to demonstrate that products are legal, deforestation-free and degradation-free. Operators are required to trace the commodities they sell back to the plot of land where they were produced. Similar, but not identical, regulations have been proposed in the USA [10] and under a China-Brazil pact [11]. Wood and wood product certification programmes are developing additional modules to align with EUDR, including providing the necessary geo-location coordinates. Consultancies and certification providers offer 'regulatory certification' services to assist forestry sector companies to comply.

This Guidance focusses on the implications of these characteristics for ESG analysis of projects.

[28] Note that the EU will publish a list of high risk areas requiring enhanced due diligence and detailed guidance on implementing the regulation.

FORESTRY SECTOR CERTIFICATIONS

11.1 Introduction

A key aspect of the forest sector is the important commercial and E&S role of voluntary certification standards. This section sets out the key environmental and social certifications in the forest sector. It looks at:

- what certifications are available for what activities;
- the range of environmental and social aspects covered in the certification;
- certification process, timelines and resource needs;
- audit processes and auditors - how projects achieve and maintain certification;
- scheme governance.

IFC PS-6, relating to biodiversity, requires all types of forestry projects, both in natural forests and forest plantations, to implement sustainable management practices to one or more relevant and credible standards, with independent verification or certification to demonstrate compliance. IFC lists FSC as an example of a relevant and credible standard.

Certifications provide comfort to investors regarding the continued quality of a project's environmental and social management through regular independent audits and can have a commercial benefit by improving access to markets or through markets that pay a premium for certified products. However, certification can be costly and where products are not targeting markets that require or will pay a premium for certified goods then it may not make sense to pursue certification. Note that IFC PS-6 still requires compliance with, and independent verification of, sustainable management practices.

Box B1: Certification schemes covered in this guidance

This chapter considers the main voluntary certifications used in the forest sector in emerging markets. These are:

- Forest Stewardship Council (FSC) certifications (Section 11.3)
- Programme for the Endorsement of Forestry Certification (PEFC; Section 11.4)
- Verified Carbon Standard (VCS; Section 11.6.3)
- Climate, Community and Biodiversity standard (CCB; Section 11.6.4)
- Gold Standard for the Global Goals (GS4GG; Section 11.6.5)

11.2 Headlines

- The scope and purpose of the IFC PS, forest certifications and carbon certifications are different, but all aim to promote sustainability and responsible practices in their respective domains. However, compliance with IFC PS cannot necessarily be inferred from the achievement of certification. The overlaps and differences are outlined in Table B1, with further detail in the corresponding sections.
- There is considerable overlap in the E&S aspects addressed by the IFC PS (and related EHS Guidelines) and by forest sector certification standards. However the scope and level of detail with which topics are covered and the expectations for audit/verification vary. In some areas, e.g. biodiversity, the approaches differ, with IFC PS taking a habitat-centered approach whilst FSC takes a, HCV-centered approach (see Section 13.6).

FORESTRY SECTOR CERTIFICATIONS

- Areas of difference include what pesticides are acceptable (more stringent in IFC); which communities must give FPIC for projects to go ahead (local communities as well as impacted Indigenous Peoples in Gold Standard and CCB); approaches to biodiversity protection (HCV versus critical habitats); the reach of labor and working condition requirements (greater in IFC). PS4 aspects, especially security, are mostly not covered in the certifications.
- Core project documents that set out ESG risks and impacts (ESIAs, Forest Management Plans, Project Design Documents) have some overlapping content. However, certification documents focus primarily on how activities will be managed to comply with the requirements of the targeted certification, while ESIAs focus on identifying risks and then defining management methods.

Box B2: Overview of IFC, FSC and forest carbon standards

The IFC PS are a set of environmental and social performance criteria that are primarily aimed at guiding private sector investments in emerging markets. The standards cover a wide range of sectors. They are designed to ensure that projects funded by the IFC, or other banks that have adopted the standards in their own policies, adhere to certain social and environmental criteria. The eight Performance Standards are supported by Guidance Notes and a series of General and sector specific Environmental Health and Safety Guidelines. Projects are assessed against the PS by investors pre- and post-investment but there is no labelling system that marks a project or its products as IFC PS compliant. Revision of the PS, Guidance Notes and EHS Guidelines is infrequent and through a public consultative process. IFC, and some other entities that use the IFC PS, disclose information on PS compliance of projects they support.

FSC certification is available to forest management and supply chain activities worldwide that meet certification criteria. The FSC system includes various elements bound together by a set of ten Principles and associated Criteria. Criteria are set through the multi-stakeholder body that governs the system. Certification requires passing independent audits by approved auditors at regular intervals and enables FSC labels to be used on products in the marketplace. FSC maintains a searchable public database of certified companies.

Carbon credits for forest sector activities are issued by a range of entities of which Verra and Gold Standard are the most widespread (as of 2023). Both systems have a range of different carbon certifications, not all of which are forest related. All are globally applicable. Certification requires projects to produce a range of defined studies and assessments and having these and the on-going performance of the project periodically and independently audited. Certification bodies disclose information on projects applying for certification pre- and post-certification. Certified projects can market the carbon credits generated. Since the Verra Verified Carbon Standard (VCS) only covers carbon accounting, it needs to be paired with the Climate, Community and Biodiversity (CCB) Standard to provide verified certification across the range of carbon, environmental and social benefits. The Integrity Council for the Voluntary Carbon Market (ICVCM) has developed principles for demand-side carbon integrity and assesses carbon credit programmes against these principles.

FORESTRY SECTOR CERTIFICATIONS

- FSC and PEFC certification systems require certified organizations to transition to new (higher) standards within a defined period after new standards are issued.
- Forest product and carbon certifications require regular audits (timing and scope vary between standards) after certification is approved. Note that the IFC PS are not a certification standard.
- IFC PS6 states that where possible clients should demonstrate sustainable management of natural resources through an appropriate system of independent certification [12].
- While certifications are based on environmental and social management requirements for projects, the end-points are sustainability labels for products, i.e. wood and wood products, tradeable carbon credits.

Table B1: Overview of the differences between IFC Performance Standards and FSC requirements.

IFC Performance Standard	Gaps in compared to FSC Certification	Section of the guidance document
PS-1: Assessment and management of environmental and social risks and impacts	Gaps in the scope of impact assessment and requirements for an Environmental and Social Management System (ESMS).Gaps in the scope of impact as-sesment (e.g. contextual risks) and re-quirements for an Environmental and Social Management System (ESMS), incl. the engagement of disadvantaged or vulnerable people, a grievance re-dress mechanism, and an emergency preparedness and response plan.	17.2.1
PS-2: Labor and working conditions	Gaps relating to protections for non-employed workers such as contractors and casual labor or migrant workers, documented information (e.g. contracts), a worker grievance mechanism, retrenchment (mass layoffs) plan, and worker training programs.	14.3
PS-3: Resource efficiency and pollution prevention	Gaps regarding resource efficiency; dif-ferences regarding control of chemicals, and explicit mentioning of greenhouse gas emissions and climate change.Gaps regarding resource efficiency; differ-ences regarding control of chemicals.	13.5
PS-4: Community health, safety and security	Gaps in all aspects, incl. emergency preparedness and response, and security management.	14.4
PS-5: Land acquisition and involuntary resettlement	IFC requirements are more detailed and include economic as well as physical resettlement.	14.5
PS-6: Biodiversity conservation and sustainable management of living natural resources	Differences between the HCV approach used by FSC and the habitat-centered approach used in PS-6.	13.2, 13.3, 13.6
PS-7: Indigenous Peoples	Differences in definitions, eligibility for compensation, and detailed requirements on Indigenous Peoples plans (IPP) and free prior and informed consent (FPIC) processes.	14.7
PS-8: Cultural heritage	PS-8 has a wider scope.	14.8

FORESTRY SECTOR CERTIFICATIONS

11.3 FSC

11.3.1 Introduction

The Forest Stewardship Council (FSC) was established in 1994 to promote the responsible management of forests globally. The system is based around ten Principles; related Criteria, and a wide range of guidance documents.

FSC certification includes six standards which apply to different forest sector activities, e.g. forest management, chain of custody, sourcing and provision of eco-system services. There is also a 'mixed wood' designation for products, i.e., not for forest management, that contain only a proportion of certified wood.

FSC also has a Continuous Improvement Procedure that allows small forest owners and communities to be initially certified based only on a subset of forest management requirements and offers flexible steps towards conformity with the remaining requirements within a defined timeframe [85].

Currently over 160 million ha. of forests globally are FSC certified using the FSC Forest Stewardship standard, with the largest certified areas in Canada, Sweden and the United States. Nine non-OECD countries each have more than 1 million ha. of certified forest [86].[29] Product certification is most widely recognized and demanded in OECD markets.

Box B3: Topics covered by FSC Principles [80]

Principle 1	Compliance with laws
Principle 2	Workers' rights and employment conditions
Principle 3	Indigenous Peoples' Rights
Principle 4	Community Relations
Principle 5	Benefits from the Forest
Principle 6	Environmental Values and Impacts
Principle 7	Management Planning
Principle 8	Monitoring and Assessment
Principle 9	High Conservation Values
Principle 10	Implementation of Management Activities

[29] Non-OECD countries with over 1 million ha. of certified forests (October 2023): Bolivia, Bosnia, Brazil, Congo Republic, Indonesia, Peru, South Africa, Uraguay.

FORESTRY SECTOR CERTIFICATIONS

Table B2: FSC certification standards

Standard	Description
Forest Stewardship Standard (FM) [80]	Verified compliance of a forest managed for wood production (natural or plantation) to FSC Principles and associated criterion and indicators. Certificate holder may make FSC claims.
Forest Management Groups Standard [81]	Specifies the requirements for entities managing a group of forest management units (e.g. sets of smallholders or s set of plantations) to attain forest stewardship certification under a single certificate. Members may make FSC claims.
(Forest) Controlled Wood Standard (FM CW) [82]	A less demanding standard than Forest Stewardship under which projects provide verified evidence that the wood they supply has been controlled to avoid wood that is: • illegally harvested; • harvested in violation of traditional and civil rights; • harvested in forest management units in which high conservation values are threatened by management activities; • harvested in areas in which natural forests are being converted to plantations or non-forest use; or • harvested from forests in which genetically modified trees are planted. Implementing the Controlled Wood standard can be a bridge for a project to achieving forest management certification. Certificate holder may not make FSC claims.
Chain of Custody Standard (CoC) [83]	This standard applies to companies involved in processing, manufacturing, and trading forest-based products. May make FSC claims based on % of FSC certified content in a product.
Ecosystem Services Procedure [73]	FSC FM certified forests may make claims for provision of ecosystem services based on verification of the claims by the Certification Body auditors.
FSC Mixed wood [84]	When a product is labelled as FSC Mixed Wood, it means that the wood used to produce the item is a mix of FSC-certified wood, recycled material, and/or controlled wood.

FORESTRY SECTOR CERTIFICATIONS

11.3.2 FSC governance

FSC is a membership organization governed and managed by a set of international and national bodies organized on a multi-stakeholder basis through its three chambers (economic, social and environmental).

National and regional Standards Development Groups adapt Principles and Criteria to reflect the diverse legal, social and geographical conditions of forests in different parts of the world. National Forest Stewardship Standards (NFSS) are approved by FSC prior to their use for certification.

In relation to governance of its standards, FSC uses approved certification bodies (CBs) to assess compliance with its standards, backed up by ASI,[30] charged with assessing the effectiveness and integrity of CBs. FSC works closely with ASI to identify potential risks and monitors high-risk supply chains. FSC gathers information about potential problems in its supply chains through the following:

- communication within FSC, its network partners and regional offices, and CBs;
- complaints received from concerned stakeholders;
- proactive monitoring of third-party information sources such as the media, websites of environmental NGOs, etc.

Organizations can, and do, have certification terminated for breach of standards.

11.3.3 Certification process

Once an organization (forest management unit / processing / retailer) believes that they have systems in place to demonstrate compliance with standards requirements they apply to one or more CBs[31] for a certification audit. An FSC CB is an independent organization that is accredited by FSC to evaluate and certify forest management operations and supply chains. They assess whether a company organization meets the standards. The CB conducts on-site annual surveillance audits on organizations that are certified, and a full audit every five years.[32]

Box B4: Losing certification [87]

In 2021, FSC and ASI started an investigation on FSC certified wood pellet supply chains in Vietnam and other South East Asian producers due to concerns that pellets were marketed with false claims of being from FSC certified wood. Following detailed analysis of trading documents, two companies selling wood pellets lost certification on the grounds that they had been making false claims that all the wood they used to make pellets was FSC certified.

[30] Accreditation Services International (ASI) [111] is an independent Organization that provides accreditation services for various certification schemes, including FSC. ASI is responsible for assessing the effectiveness and integrity of CB's. ASI will frequently join CB's audits of certifies companies to access / verify compliance with the accreditation standards. frequently join CB's audits of certifies companies to access / verify compliance with the accreditation standards. standards.

[31] Different global regions have FSC websites, where lists of the CBs can be found e.g. Malaysia [112]. It is important to note that in some regions (e.g. Africa) there are limited CBs, which can pose cost, timeline and capacity problems for operations seeking certification.

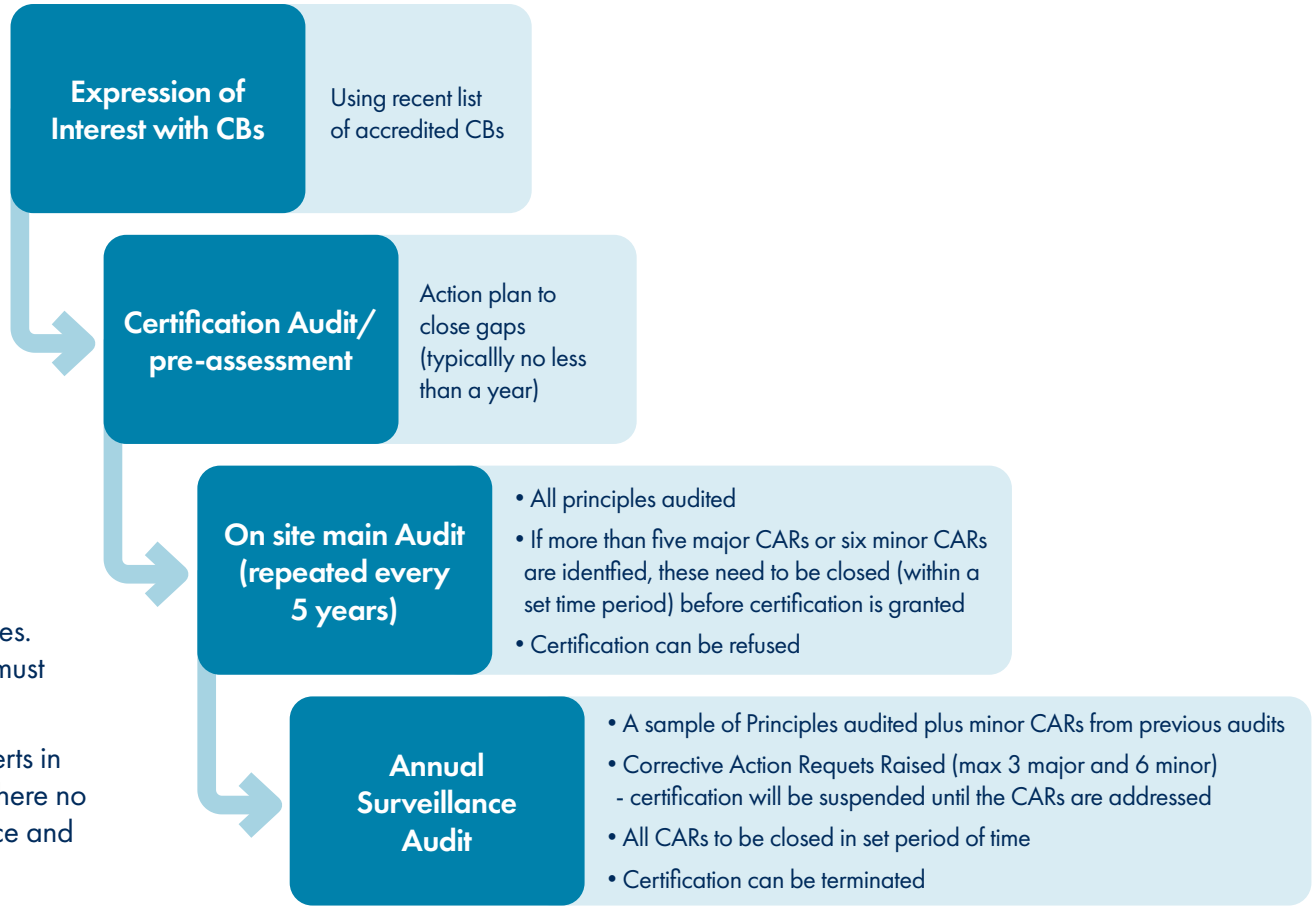
[32] A change of scope can be introduced at surveillance audit stage, generally relating to an increase in land area, however if this change is seen to be significant (e.g. more than a 20% increase of certified area) a main audit will be requested.

FORESTRY SECTOR CERTIFICATIONS

In detail:

- CBs assess criteria (from a pre-assessment form) to determine whether the organization has the necessary baseline requirements and offer a quote for certification.
- This is followed by a pre-assessment audit, where the CB auditor checks documentary and infield evidence of compliance to determine any significant gaps that may prevent certification or need to be addressed prior to a main assessment audit.
- Once identified gaps have been addressed, the CB conducts the main assessment audit. This is normally undertaken by a lead auditor with skills in forest management, and a local specialist with local expertise (often social aspects). During the audit all indicators are checked for compliance, and stakeholders consulted
  - Corrective Action Requests (CARs) are raised for non-compliances. If there are a number of minor CARs or a major CAR then these must be addressed prior to consideration of certification by the CB.
- Once the audit report is complete it is submitted for review by experts in the CB to determine consistency and completeness of the audit. Where no concerns have been raised the CB issues a certificate of compliance and the organization can start to make FSC certification claims.

Figure B1: FSC certification process



FORESTRY SECTOR CERTIFICATIONS

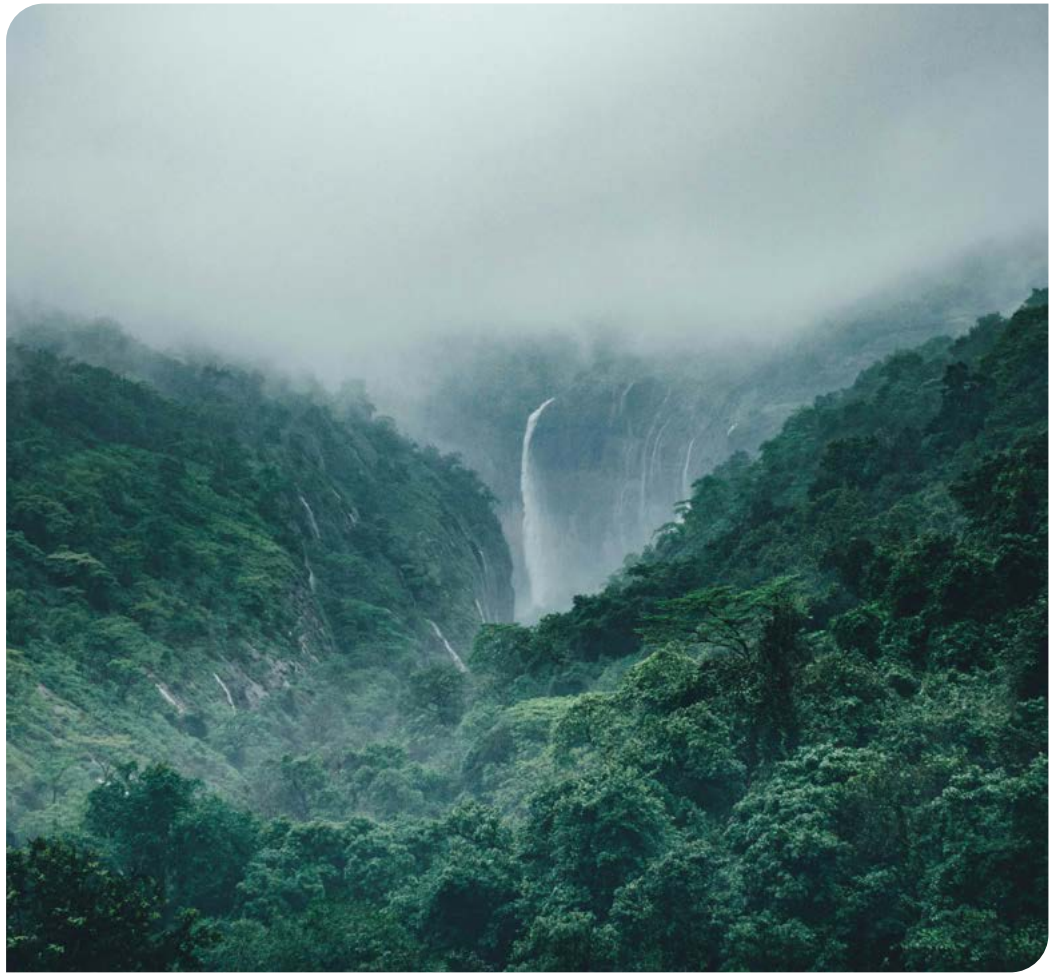
11.3.4 Indicative timelines

Time frames for achieving certification depend on many factors, but primarily the level of commitment of owners, managers and staff in the form of policies and allocation of budget and time. Experience has shown that this can vary from 18 months for a well prepared and experienced organization to 5 or more years where certification is new to an organization and it has limited expertise and resources to deploy. Where organizations have ESG staff with expertise in FSC there may be a need only to develop and implement a plan for certification; where these resources are not available in-house it is usually necessary to contract this work to external specialists until such time as the knowledge is available within the organization.

Projects can face significant challenges if achieving FSC certification is a pre- requisite for investment and the project and/or the investor are not realistic about timeframes and resource requirements. It is widely required by investors within a defined period post-investment with a pre-feasibility assessment completed as part of due diligence to provide comfort that

Box B5: Addressing the dilemma between certification and finance

In one group scheme project that required FSC certification prior to financing, but could not proceed at scale without guaranteed finance, the project sponsors agreed with investors that they would develop the necessary group scheme management systems and also set up two pilot operations to demonstrate their capability to achieve compliance. FSC auditors audited compliance of the management system and the two pilot operations. Since then, with finance secured, additional group members have been added. During annual surveillance audits, the auditors verify compliance of new group scheme members.



Pune, India. Atharva Tulsi on Unsplash images.

FORESTRY SECTOR CERTIFICATIONS

Box B6: PEFC core requirements

All national sustainable forest management requirements must include the following:

- Maintenance, conservation and enhancement of ecosystem biodiversity
- Protection of ecologically important forest areas
- Prohibition of forest conversions
- Recognition of free, prior and informed consent of Indigenous Peoples
- Promotion of gender equality and commitment to equal treatment of workers
- Promotion of the health and well-being of forest communities
- Respect for human rights in forest operations
- Respect for the multiple functions of forests to society
- Provisions for consultation with local people, communities and other stakeholders
- Respect for property and land tenure rights as well as customary and traditional rights
- Compliance with all fundamental ILO conventions for worker rights
- Working from minimum wage towards living wage levels
- Prohibition of genetically modified trees and most hazardous chemicals
- Exclusion of certification of plantations established by conversions, including conversions of ecologically important non-forest lands (e.g. peatlands)
- Climate positive practices such as reduction of GHG emissions in forest operations.

certification is possible within the agreed timeframe and to guide the investor and project on the steps and budget needed. A pre-feasibility assessment can also highlight areas where additional expertise may be needed. A sufficiently funded and resourced plan for certification can help to facilitate the process of achieving certification.

11.4 Other Forest Certifications

The Programme for the Endorsement of Forest Certification (PEFC) [88] is a second global certification system for sustainable forest management. Unlike FSC, this is an industry-led standard. The sustainability requirements of PEFC include legal compliance, environmental protection, social responsibility, and economic viability. Instead of a single global standard PEFC provides endorsement and recognition of national or regional forest certification standards that meet its sustainability requirements (see box B6). As of June 2023, around 291 million hectares of forest area was PEFC certified, and more than 12,000 PEFC chain of custody certificates had been issued; 90% of the certified area is in North America, Europe and Oceania [89]. Core elements of PEFC are shown below.

- The Sustainable Forest Management benchmark (PEFC ST 1003, [90]) lays out the international requirements for sustainable forest management.
- To be endorsed by PEFC, a national forest management standard must address these requirements [91].
- On the ground, this benchmark is the basis for the requirements that forest owners or managers must meet to achieve PEFC certification at local level [92]. Group as well as individual certification is available.
- PEFC also includes chain of custody certification for forest and tree-based products.

FORESTRY SECTOR CERTIFICATIONS

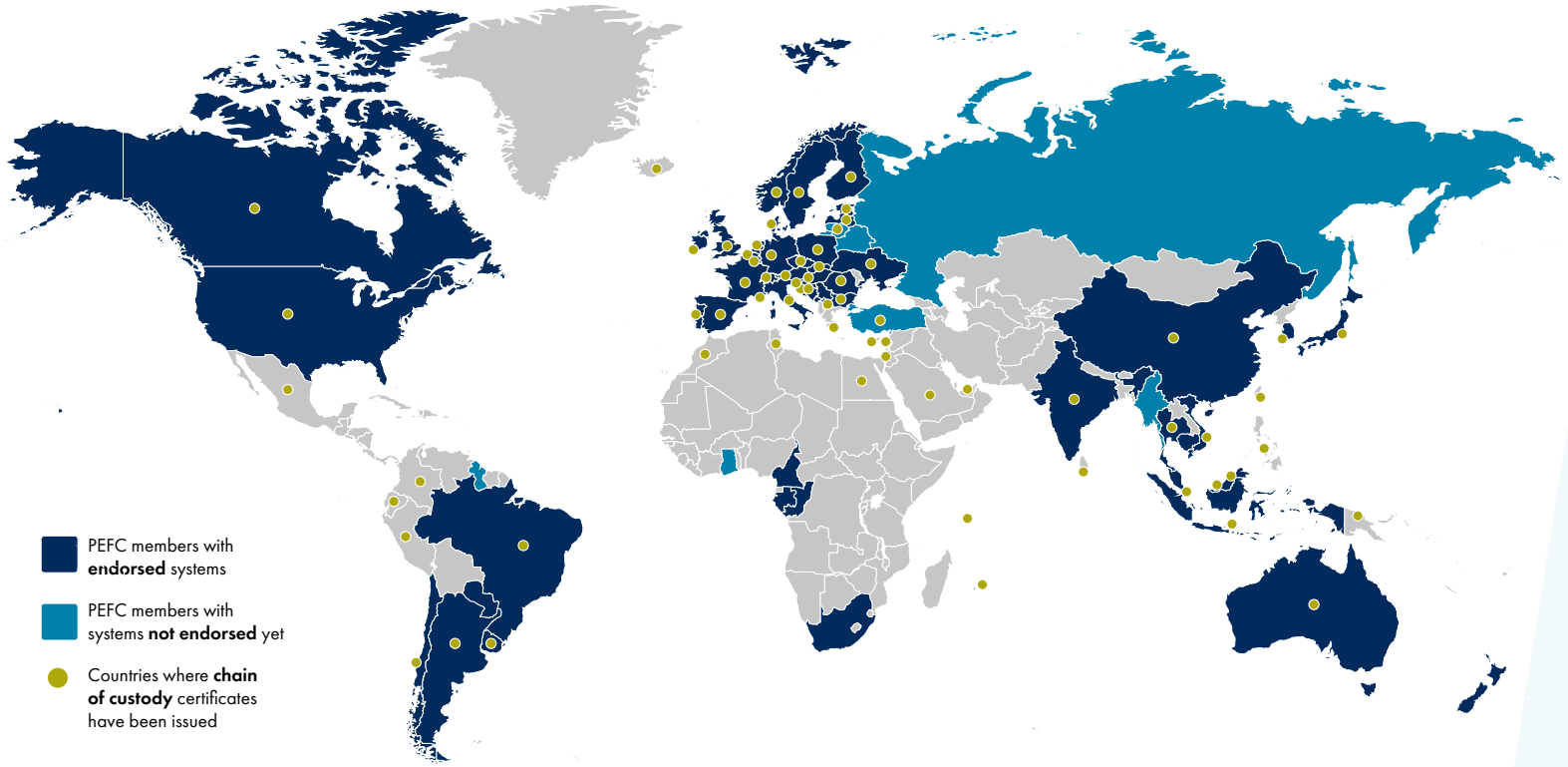


Figure B2: Countries that are PEFC members. Including those with endorsed systems (dark blue), systems that have not yet been endorsed (light blue) and issued chain of custody certification (green dots). Source: https://pefc.org/discover-pefc/facts-and-figures#

There are 49 endorsed country standards (figure B2); for example Argentina, Brazil, Chile and Uruguay have country standards [93]. However few African countries do, currently only South Africa, Republic of Congo, Cameroon and Gabon. PEFC certification is not available in countries without endorsed standards. PEFC endorsed standards are developed through a bottom-up approach, with in-country interest groups developing a regional or national standard by consensus which becomes part of a national initiative and is then assessed and endorsed by PEFC if it meets PEFC benchmark requirements. FSC, by contrast, is top-down, with the principles and criteria determined by FSC, with optional country-specific guidelines developed through national initiatives where needed.

Similar to FSC, certification is based on audits by accredited independent third parties.

FORESTRY SECTOR CERTIFICATIONS

11.5 Legal Wood

Alongside national legislation, there are international conventions and regulations that regulate the harvest and trade in wood and wood products.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) establishes restriction on trade including on specific tree species. Appendix I species are threatened with extinction and international trade is prohibited. Appendix II species are not necessarily threatened with extinction at the moment but may become so unless trade is closely controlled. Export permits are required confirming that trade will not be detrimental to the survival of the species in the wild. Appendix III is a list of species for which trade is regulated in one or more jurisdictions and cooperation is needed from other countries to prevent unsustainable or illegal exploitation. International trade in specimens of species listed in Appendix III is allowed only on presentation of the appropriate permits or certificates [94]. Listings can be very detailed and apply to specific locations and uses. CITES has an on-going programme of research, review and revision of listings. In addition, most countries that produce wood have national or local definitions of what constitutes 'legal' wood, and related permit systems. A requirement of FSC and PEFC certification is third-party assurance of legality. Where wood is sourced from producers that are not certified, separate certification of legality may be required.

The EUDR[33] regulation [9][34] replaces the previous EU system for defining 'legal' wood with an expanded system that covers legality, deforestation-free and conversion-free. EUDR will come into force at the end of 2024. Under the Regulation, any operator or trader who places wood or wood products on the EU market, or exports from it, must be able to prove that the products do not originate from recently deforested land or have contributed to forest degradation. The key new element is the requirement that operators and traders (except SMEs) must collect geographic coordinates of the plots of land where the commodities were produced, and geolocation coordinates need to be provided in the due diligence statements that operators are required to submit ahead of the placing on the market or export. This means, for example, that wooden furniture on sale within the EU must be fully traceable down to the point of wood harvest. For composite products, such as e.g. wooden furniture with different wood components, the operator needs to geolocate all the plots of land where relevant commodities (wood for example) used for the manufacturing process has been produced. Detailed rules and guidance are expected during 2024. FSC and PEFC are making adaptations to align with EUDR.

Mechanised Harvesting

[33] Refer to: Deforestation Regulation implementation - European Commission (europa.eu)
[34] Note: the regulation also applies to cattle, wood, cocoa, soy, palm oil, coffee, rubber.

FORESTRY SECTOR CERTIFICATIONS

11.6 Carbon Certification Schemes

11.6.1 Introduction

Carbon credit certification schemes are mechanisms designed to validate and verify greenhouse gas reduction projects, ensuring they meet specific environmental and social criteria. Through the certification process, projects generate verified carbon units (VCUs), also called carbon credits, which can then be traded through voluntary carbon markets.

The two most widely used standards are Verified Carbon Standard (VCS) and Gold Standard (GS). Gold Standard covers both carbon accounting and environmental and social performance, whilst VCS focuses solely on carbon accounting unless paired with the linked (optional) Climate, Community and Biodiversity (CCB) standards, which cover benefits to communities and biodiversity. Figure B3 shows a generalized overview of the steps a project needs to take to generate carbon credits.

Supply-side carbon integrity schemes, such as the ICVCM Core Carbon Principles [60], provide high-integrity criteria for carbon crediting programs to address concerns about the quality and credibility of credits entering the market. As of March 2024, both VCS and GS are under assessment by ICVCM. As ICVCM completes assessments investors and buyers of credits will be able to check that certification schemes and methodologies meet the Core Carbon Principles. Those that do will be listed as CCP-Eligible and will be able to issue CCP-Approved carbon credits.

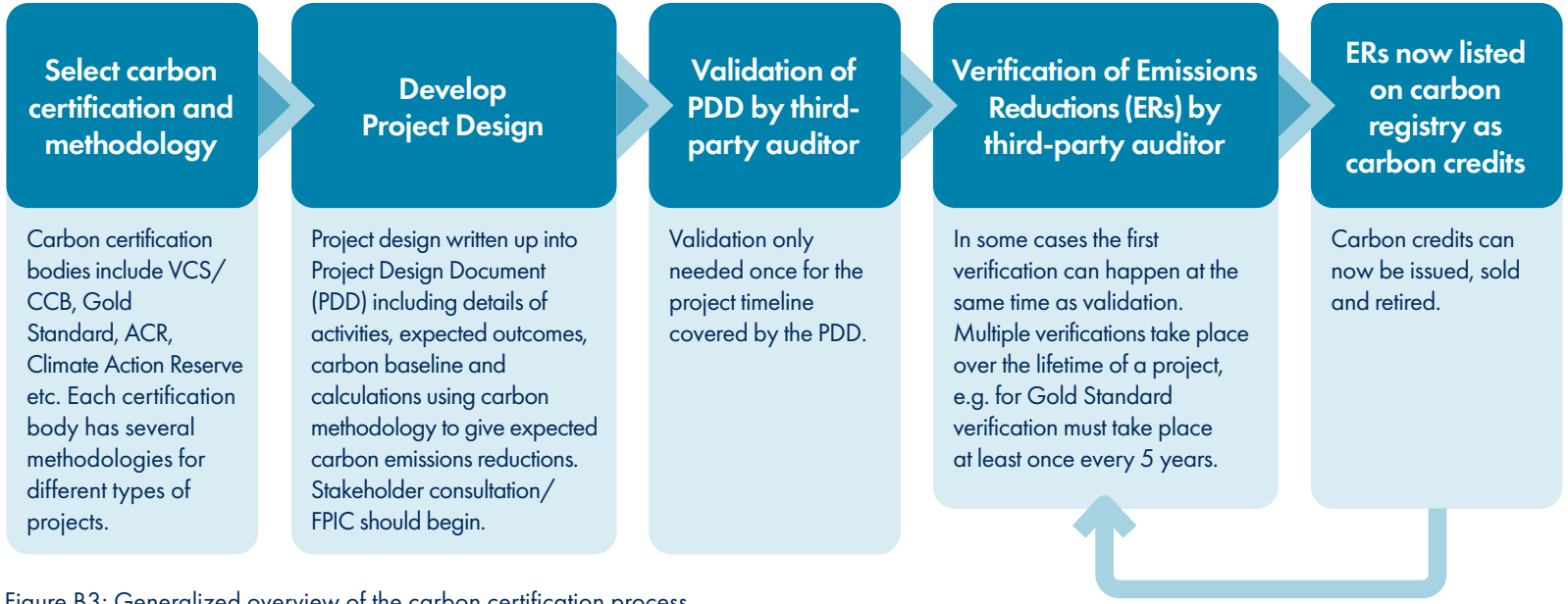


Figure B3: Generalized overview of the carbon certification process.
Each certification body will have its own specific process which may include additional steps.

11.6.2 Key concepts for forest carbon projects

Additionality requires the emissions reductions or carbon sequestration achieved by a carbon offset project to be additional to what would have occurred in a business-as-usual scenario. Additionality ensures that carbon offset projects are making a real and measurable difference in reducing emissions or enhancing carbon sequestration. To demonstrate

FORESTRY SECTOR CERTIFICATIONS

additionality, project developers typically need to prove that the project would not have occurred without the financial incentives provided by carbon credits. e.g. by conducting a thorough baseline analysis and demonstrating that the project's activities go beyond business-as-usual practices.

For plantation projects, additionality is a key question. If the plantation would be established regardless of the generation of carbon credits, then there is no additionality. A project needs to demonstrate that without the income from carbon credits the plantation would not be viable, making carbon generation in plantations most relevant to frontier countries where plantation forestry is not yet established.

Leakage refers to a carbon project leading to emissions reductions in one location or sector but increased emissions in another location or sector. e.g. if a forest protection project prevents logging in one area, it might lead to increased logging in a nearby unprotected area. Leakage is important because it ensures that emissions reductions achieved in one area or sector do not simply shift emissions elsewhere, negating the project's overall climate benefits. To address leakage, project developers must carefully analyze potential leakage effects and implement mitigation strategies to minimize or counteract them. In addition, the volume of carbon credits generated by the project is discounted to take into account any leakage not accounted for through mitigation.

Calculating leakage has become more sophisticated in recent carbon accounting methodologies. Projects that involve a change of land use must take into account the potential increase in the sector elsewhere due to the land use change. For example, a project that involves land use change from degraded cattle pasture to plantation or natural forest regeneration must consider how the volume of cattle that were previously supported by the

Sui Forest Reserve - Image courtesy of Partnerships for Forests

FORESTRY SECTOR CERTIFICATIONS

degraded pasture will be absorbed into the cattle sector, or the project faces an additional credit discount to take into account potential deforestation elsewhere.

Permanence refers to the long-term stability and durability of carbon reductions or carbon sequestration. It addresses the risk that the stored carbon may be released back into the atmosphere in the future due to factors like natural disturbances (e.g. wildfires or disease) or human activities (e.g. deforestation). Ensuring the permanence of carbon reductions is crucial because the long-term goal of carbon offset projects is to contribute to lasting emissions reductions. To address permanence, project developers implement measures like sustainable forest management and investing in the local community to establish alternative businesses that generate more income than previous activities related to deforestation and forest degradation. Carbon accounting methodologies apply a buffer on carbon credit generation to take into account some lack of permanence, e.g. to cover natural disturbances that cause some loss of trees.

For plantations, the trees are never intended to be permanent. To address this carbon accounting methodologies for plantations take into account the use of the trees after harvest. In the most conservative scenario, all stored carbon is assumed to be emitted following harvest, and the model takes the average carbon stock for the lifetime of the plantation as the maximum volume of credits that can be issued. Where timber is destined for construction or similar industries where it is likely to maintain a proportion of the stored carbon, this is taken into account. Current methodologies for plantations cover only the plantation trees, however a new ARR methodology is being developed that will cover both plantation trees and areas protected/restored for biodiversity.

11.6.3 Verified Carbon Standard (VCS)

VCS was first established in 2007 by Verra, a non-profit organization, and is the world's most widely used greenhouse gas (GHG) crediting programme. VCS projects have been certified as reducing or removing nearly one billion tons of carbon and other GHG emissions from the atmosphere. VCS can certify emission reductions and removals from a number of different sectors including renewable energy production, waste handling and disposal (e.g. biochar) and agriculture, forestry and other land use (AFOLU).

Within the AFOLU project categories, the following are potentially applicable to forestry projects:

- Afforestation, reforestation and revegetation (ARR) – projects that increase carbon sequestration and/or reduce GHG emissions by establishing, increasing or restoring vegetative cover by planting, sewing or human-assisted natural regeneration of woody vegetation. The project area must not have been cleared of native ecosystems within 10 years of the project start date.
- Improved Forest Management (IFM) – projects that increase carbon sequestration and/or reduce GHG emissions on forest lands managed for wood products by increasing biomass carbon stocks through improving forest management practices. Eligible IFM activities include reduced impact logging, converting logged forests to protected forests, extended rotation age/cutting cycle, conversion of low-productivity forests to high-productivity forests. Avoided planned degradation is classified as IFM.
- Reduced Emissions from Deforestation and Degradation (REDD) – projects that reduce net GHG emissions by reducing deforestation and/or degradation of forests e.g. by reducing activities such as animal grazing, fuelwood extraction, timber removal etc. Activities covered under the REDD project category are those that are designed

FORESTRY SECTOR CERTIFICATIONS

to stop planned (designated and sanctioned) deforestation or unplanned (unsanctioned) deforestation and/or degradation.

- Wetlands Restoration and Conservation (WRC) – projects that increase net GHG removals by restoring wetland ecosystems or that reduce GHG emissions by rewetting or avoiding the degradation of wetlands. Wetlands can include some forest types e.g. peat swamp forest, mangroves, and wet floodplain forests. These are also known a blue carbon projects.

Within each category are a number of methodologies. Specialist carbon accounting expertise is required to identify which methodology is suitable for a project and to support the development of the Project Design Document (PDD), a crucial component of the certification process. It provides detailed information about the project's design, methodology, and key aspects to ensure transparency, credibility, and accountability. VCS methodologies are updated regularly to maintain their integrity therefore it is possible that projects may need to move to compliance with newer versions of methodologies as they are launched. Not all VCS methodologies have been submitted to ICVCM for carbon integrity assessment.

The key steps of project development are as follows.

- Listing the project with the selected issuer of credits based on a draft PDD. This is a public document followed by a 30-day public comment period. All comments received during this time must be addressed by the project developer in the final PDD.
- Validation by a third-party auditor who approves the final PDD. Upon completion, this results in successful project registration. The length of the validation process varies from project to project. In rare cases (such as when a new accounting methodology is proposed) this process can take over a year.
- Verification by a third-party auditor against the project's monitoring plan to confirm the emission reductions and/or removals the project has achieved. A project's first verification audit may take place at the same time as the validation audit.
- VCUs can be issued, traded and retired.

VCS certifies the quantification and verification of greenhouse gas reductions and removals; it does not monitor environmental or social benefits. However, Verra also operates CCB, which can be assessed concurrently with VCS to generate VCUs certified to both standards.

11.6.4 Climate Community and Biodiversity (CCB) Standards

The CCB standards are available for land use projects such as afforestation, reforestation, REDD, agriculture etc. To be eligible under the CCB standards, a project must have specific and measurable climate, community and biodiversity objectives, and demonstrate impact in all three areas. For each dimension, an enhanced, 'gold' level certification is also available.

The CCB standards require some general ESG good practices such as stakeholder engagement, checks on legal status and property rights etc. In addition, they cover the following.

Climate – Estimated GHG emissions in the without-project scenario, estimated emissions reductions or removals in the with-project scenario, offsite climate impacts, climate impact monitoring and climate change adaptation benefits.

Community – description of the community without-project scenario, impacts on community well-being due to project activities, no damage to HCVs, impacts on well-being of other stakeholders, community impact monitoring and exceptional community

FORESTRY SECTOR CERTIFICATIONS

benefits e.g. smallholders/community members gain land rights, positive impacts on well-being for smallholders/ community members/vulnerable or marginalize groups/women etc.

Biodiversity – description of the biodiversity without-project scenario, net positive impacts on biodiversity, offsite biodiversity impacts, biodiversity impact monitoring and exceptional biodiversity benefits e.g. demonstrate the project zone includes a site of high biodiversity conservation priority, improvement in the population trend of a vulnerable or irreplaceable species, etc.

Forest carbon projects aiming for both VCS and CCB certification can use a streamlined approach. Combined project documentation and validation and verification report templates are available to make it easier and cost effective to combine CCB Standards and VCS through all stages of project development and implementation. The use of the combined templates is required

Box B7: Examples of 'gold' level certification under CCB [95]

Climate Gold – projects must provide significant support to communities and/or biodiversity to adapt to anticipated climate change impacts and risks.	**Community Gold** – for smallholder- and community-led or pro-poor projects implemented on lands owned or managed individually or collectively by smallholders or community members or explicitly to benefit globally poor communities. Requires net positive human well-being benefits across the following, based on household-level data collection:	**Biodiversity Gold** – for projects that conserve biodiversity in areas that qualify as Key Biodiversity Areas (KBAs). Requires projects to:
• Likely regional or sub-national climate change and climate variability scenarios and anticipated impacts on Communities and biodiversity should be identified and assessed; • Measures to assist communities and/or biodiversity to adapt to the probable impacts of climate change must be identified and implemented; • The effectiveness of these measures must be monitored and assessed including an evaluation the impacts by affected communities.	• opportunities: creating (and not blocking) material opportunities for wealth creation and well-being, such as jobs, revenue streams, infrastructure, and improved educational conditions; • security: enhancing (and not weakening) populations' security, including tenure security, food security, livelihood security, and capacity to adapt to climate change; and • empowerment: facilitating (and not preventing) the empowerment of individuals and communities to participate in decisions affecting local land use and development. • explicitly demonstrate net positive well-being benefits to women • equitable benefit sharing not only between the project and the communities, but also among smallholders/ community Members.	• identify all vulnerable or irreplaceable ('trigger') species in the KBA; • select trigger species for monitoring • assess the pollution trends of trigger species • develop a causal model to show how project activities will positively impact trigger species • identify and monitor indicators of change.

FORESTRY SECTOR CERTIFICATIONS

when using both standards. As with VCS, CCB standards require both validation and verification audits.

Verification audits must be spaced no more than 5 years' apart, however the project may choose to verify more frequently. It is considered good practice to audit projects annually to confirm that the project is operating as described.

11.6.5 Gold Standard for the Global Goals

Gold Standard (GS) certification is called in full 'The Gold Standard for the Global Goals (GS4GG)'. It was established in 2003 by WWF and other international NGOs as a best practice standard to ensure projects that reduced carbon emissions featured the highest levels of environmental integrity and contributed to sustainable development. The standard can be applied to projects within the programme's scope that contribute positively to climate security and sustainable development, measured by demonstrating a positive impact on SDG 13 (Climate Action) and at least 2 other SDGs. GS does not certify REDD+ projects.

Impacts that can be certified under GS4GG include:

- Emission reductions (carbon credits)
- Renewable energy
- Water benefits
- Gender equality
- Improved health outcomes
- Black carbon[35] reductions, e.g. improved cookstoves.

A project that impacts several of the SDGs can potentially achieve multiple certifications. Projects can also achieve dual certification to GS and FSC, resulting in certified commodities with improved climate impact [96].

GS has 5 core principles, safeguarding principles and stakeholder engagement requirements which apply to all projects, with additional impact quantification methodologies and related product requirements specific to project types. For forestry projects, GS4GG Land Use & Forests Activity Requirements [97] would apply, alongside a carbon methodology, e.g. Methodology for Afforestation/ Reforestation (A/R) GHGs Emission Reduction & Sequestration [98].

The key steps of project development are as follows:

- Project planning – an appropriate methodology should be identified or, if not available, a proposal for a new methodology should be submitted to GS at this stage. The project eligibility within GS Principles and Requirements should be confirmed.
- Stakeholder consultation and safeguards – GS guidelines should be followed to undertake stakeholder consultation regarding the project plans.
- Preliminary review – this review determines whether the project has the potential to comply with GS requirements. It can take up to four weeks for complex projects e.g. when a new methodology is being used. Once approved, the project is then publicly listed in the GS Impact Registry.
- Validation by an independent third-party – review of the project's impact estimates, PDD, monitoring plan and safeguarding principles assessment. The timeline for validation varies between projects.
- Design certification review – GS check of the validation. Once approved the project will be listed as "design approved" in the Impact Registry. This process takes a minimum of four weeks.
- Verification by an independent third-party. Musty occur at least once in the 5-year verification cycle. The timeline varies between projects.
- Performance review – GS check of the verification. Once approved the project will be listed as a "certified gold

[35] Black carbon and other short-lived climate pollutants are by-products of burning diesel, coal, firewood and crop residue. Projects like improved cookstove projects can reduce black carbon emissions.

FORESTRY SECTOR CERTIFICATIONS

standard project". This process takes a minimum of three weeks.

- Design certification renewal – must happen at least every 5 years and involves assessment by an independent third-party followed by a check by GS.

11.6.6 Audit Processes and Auditors

For CCB and VCS audits, an accredited auditor must be used. Lists of accredited auditors can be found on the Verra website [100]. The same validation/verification body may be used for both validation and the first verification, however subsequent verifications must be undertaken by a different validation/verification body. One validation/verification body can verify a maximum of six years' of a project's emissions reductions or removals.

GS projects must achieve validation within 2 years of listing the project with Gold Standard and undertake verification and a performance review at least every 5 years after that. Performance certification (to issue SDG impacts including emission reductions) needs to happen at least once in a 5-year verification cycle but can happen more frequently if desired. All projects are required to submit annual reports to Gold Standard which are made publicly available through the Gold Standard website. As with CCB and VCS, an accredited auditor must be used for validation and verification audits, and the list of accredited auditors can be found on their website [101]. Unless required by the specific methodology, general GS requirements do not limit the number of verification/validation audits conducted by the same accredited auditor.

Ensuring that the auditor appointed by the project has a good reputation can provide added assurance regarding some of the supply-side carbon integrity concerns.

Box B8: Example of a Gold Standard certified forest project [99]

The project located in Colombia is applying the Afforestation/Reforestation GHG Emissions Reduction & Sequestration Methodology. The objective of the project is to produce high quality hardwoods (Acacia, Pine and Eucalyptus) while stabilising and restoring fragile and degraded areas. It includes both plantation and conservation areas on land that was previously savannah.

It impacts SDG 8: Decent Work; SDG 12: Responsible Consumption and Production; SDG 13: Climate Action and SDG 15: Life on Land.

It was approved for certification in 2016, has been issuing credits since 2017, and has had one 5-year performance review.

FORESTRY SECTOR CERTIFICATIONS

11.7 Deforestation: definitions and cut-off dates

Certification standards for sustainable forest projects and for forest-based carbon credits include criteria relating to deforestation that go beyond the requirements in IFC PS to avoid conversion or degradation of critical habitat. In addition, the European Union Deforestation Regulation (EUDR) requires that wood and wood products sold in the EU meet its deforestation-free criteria. Investors must ensure that land used for forest sector projects meets the applicable deforestation criteria. These criteria are outlined below. (Note that these specifications are supplemented by a range of detailed notes and definitions that should be consulted.)

The date of deforestation can be verified in a number of ways. Where satellite data is available for the relevant time period it may be possible to us that to verify claims. See Section 13.3.1 for more information on remote sensing technologies. Alternatively date stamped photographs or local records including land use may provide confirmation.

Table B3: Deforestation cut-off dates in certification standards

IFC PS	There is no specific cut-off date for deforestation within the IFC PS, however IFC PS-6 guidance states that it respects the cut-off dates for the conversion of natural habitat as established by internationally recognized voluntary certifications such as FSC.
FSC	FSC requirements were changed in 2022. The new policy is that FSC will not certify any land that has been converted from natural forests or where there has been destruction of High Conservation Values after 31 December 2020. (This is complemented by a new system ensuring remedy for social and environmental harm on land converted between 1 December 1994 (the former cut-off date) and 31 December 2020.) [102]
PEFC	Forest conversion permitted under specified circumstances only including no damage to ecologically important forest areas. [90]
VCS/CCB	The project area must not have been cleared of native ecosystems, i.e. a landscape composed of indigenous vegetation not established by planting and/or seeding [102] within 10 years of the project start date [103].
Gold Standard	The project area shall not meet the definition of forest 10 years before (and at) the project start date [96].
EUDR	Products that contain, or have been made using wood, must have been harvested from forests without inducing deforestation or forest degradation after 31 December 2020. 'Forest degradation' means the conversion of primary forests or naturally regenerating forests i.e. secondary natural forest, into plantation forests or into other wooded land.

FORESTRY SECTOR CERTIFICATIONS

11.8 Jurisdictional REDD+

Jurisdictional REDD+ is a forest conservation and climate mitigation strategy that aims to address deforestation and forest degradation at the jurisdictional or regional level, rather than on a project-by-project basis.[36] To date, only Guyana has generated and traded jurisdictional REDD+ credits. The Cancun Safeguards [104], which cover consistence with international conventions, transparency, respect for the knowledge and rights of Indigenous Peoples and local communities, stakeholder participation, conservation of forests and biodiversity, permanence and leakage provide the E&S framework for jurisdictional REDD+.

It is worth noting that should a country begin the process of jurisdictional REDD+ it will define how existing voluntary projects 'nest' within the jurisdictional approach. The process of developing a jurisdictional approach may lead to a moratorium on sales from voluntary carbon projects as the jurisdictions works out how to nest these projects. Being able to demonstrate compliance with the Cancun Safeguards may assist projects nest into jurisdictional frameworks as these are developed.

Sui Forest Reserve - Image courtesy of Partnerships for Forests

11.9 Compliance Markets

Carbon credits issued by voluntary GHG crediting programs can be traded on some compliance markets. VCS credits can currently be used in the Colombian carbon market (although only those credits generated in Colombia are eligible) and the South African carbon market. The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)[37] accepts both VCS and GS carbon credits with vintages between 2016 and 2020.

Other compliance markets limit the types of carbon credits that are eligible, e.g. the EU Emissions Trading Scheme currently excludes Land Use, Land Use Change and Forestry (LULUCF) credits.

[36] Note: the regulation also applies to cattle, wood, cocoa, soy, palm oil, coffee, rubber.

[37] CORSIA is a global program initiated by the International Civil Aviation Organization (ICAO) to address the environmental impact of carbon emissions from international flights. It aims to cap net emissions from international civil aviation at 2020 levels through a two-phase approach, with the first phase (2021-2026) focusing on voluntary participation and the second phase (from 2027) mandating participation from most countries. CORSIA requires airlines to offset their emissions above the baseline level by purchasing carbon credits from approved emission reduction projects. [115]

IMPACT GENERATION

The range of potential impacts generated by forest sector projects have been outlined in Section 8. Here we consider how impacts are materialised, monitored and reported.

12.1 Quality and integrity of offsets

Specific types of impacts, such as carbon emissions reductions, can be quantified and verified by independent third parties to generate offsets. Offsets can be used to mitigate environmental impacts, including carbon emissions, impacts on biodiversity or water quality, and loss of habitat. As the market opportunities for these offsets are starting to develop, so are the frameworks for controlling the markets.

For carbon offsets, Carbon Integrity Policies include approaches to ensure quality and integrity of offsets.[38]

biodiversity offsets, companies are being encouraged to adopt science-based targets to provide transparency. Habitat offsets can be considered a subset of biodiversity offsets.

There are several initiatives to support this.

- The Science Based Targets initiative (SBTi) [105], a partnership between several organizations, including the UN Global Compact, WWF, CDP, and the World Resources Institute (WRI), which provides guidance and support to companies in setting and achieving science-based targets.
- The Science Based Targets Network (SBTN) [106], a coalition of environmental NGO's and organizations. The SBTN provides technical instructions to assess impacts on; biodiversity, freshwater, land and climate (through SBTi).
- No Net Loss and Net Positive Impact Approaches for Biodiversity [79], a guidance document from the Global Business and Biodiversity Programme of IUCN compares the concepts of no net loss and net positive impact (or net gain) approaches to biodiversity within the commercial agriculture and forestry sectors and sets out a process for implementing a net positive impact approach.
- The Integrity Council for the Voluntary Carbon Market (ICVCM) Core Carbon Principles [60] set out 10 principles that should be followed for high integrity production of carbon credits. This is a supply-side integrity initiative.
- The Voluntary Carbon Market Integrity Initiative (VCMI) Claims Code of Practice [107] is a demand-side integrity initiative that provides guidance for organizations making carbon emissions claims relating to carbon credits.
- The Biodiversity Credit Alliance [108], supported by UNDP and UNEP is working towards defining and categorising Biodiversity Credits and co-developing a model set of digital standards for the market, and establishing a peer review mechanism for biodiversity credits.
- The World Economic Forum has identified the conditions for success to be integrity and inclusion [109]. Where strong governance, and inclusion of all actors and market participants, such as Indigenous People and local communities, private sector, public sector, and civil society are critical.
- Verra is developing a biodiversity methodology as part of the SD VISta programme, to independently assess and verify real-world biodiversity benefits and certify nature-positive investments [110].

A recent paper by the Taskforce on Nature Markets on the Biodiversity Credit Market [111], makes a case for "biodiversity credit markets" that finance 'real' gains for biodiversity, in contrast to "biodiversity

[38] For more information and further guidance regarding carbon integrity see Implementing Approaches to Carbon Credit Integrity: A practical guide for impact-focused investors [62]

IMPACT GENERATION

offset markets" where gains in one location are offsetting losses in another.

Given the potential benefits to water quality from forests, forest projects could become a source of water quality offsets. FSC ecosystem services certification covers impacts on watersheds.

12.2 Permanence of positive impacts

Permanence considers the longevity of impacts. It is of particular concern when impacts are used to offset for loss elsewhere – the loss is generally permanent, e.g. the emission of a ton of CO2, and therefore the offset should be too. As such this is a central concept for carbon credits to ensure they are robust. When markets are developed for biodiversity credits, permanence is likely to be central to those crediting methodologies as well. See Section 11.6.2 for more information regarding how permanence is addressed in carbon credit certification. Due to the long-term nature of forest investments, impact permanence can be easier to demonstrate than for shorter term projects.

For many social impacts, e.g. employment, permanence is not relevant. Whilst it is important to differentiate between temporary and permanent employment in projects in order to understand potential impacts on livelihoods, considering whether those jobs will still be available in 50 or 100 years is not relevant to the quality of the impact today.

12.3 Optimising the impact proposition

Forestry projects have the potential to generate significant impacts since they are generally large-scale and operate over a long timeframe. Considerations that could be included in forest management plans or PDDs for forest carbon projects to optimize impacts include the following.

- Maximizing tree diversity in plantations, particularly if native species are suitable. This could improve the value of plantations for local biodiversity, alongside having potentially enhanced soil and climate benefits.
- Considering the location of the project within the wider landscape e.g. if the project is between two areas of biodiversity significance (e.g. protected areas) could a biodiversity corridor be incorporated into the project design. Projects should consider their activities in relation to the landscape both spatially and temporally.
- Employment could prioritize local people and have targets related to training and career development of local staff.

Projects with multiple components including natural forest protection, carbon credits, and processing facilities are potentially well placed to maximize benefits.

12.4 Measuring impacts

Measuring robust impact data for any project can be challenging and the forest sector is no different. For projects and investors seeking to measure impacts, there is a tension between clearly defining the impacts being targeted and finding practical ways to measure progress towards those targets.

Some impacts, such as improvements in biodiversity or people's livelihoods, have a time lag between implementing activities and seeing measurable change (10+ years), often longer than the tenure of the investment. In these cases, interim indicators are needed to track progress e.g. for an impact goal of improving biodiversity, the area of land protected or planted with native vegetation could be activity-level indicators that would show change in the short term. Also, changes in invertebrate populations might be seen more quickly than changes in mammal or bird populations. For an

IMPACT GENERATION

impact goal of improving the livelihoods of local smallholders, interim activity-level indicators could include the number of smallholders involved in the project, or the hectares of trees planted on smallholders' lands.

Projects can seek third-party verification and certification of impact through schemes including:

- Verra's Sustainable Development Verified Impact Standard (SD VISta) [112]
- Landscale [113]
- FSC Ecosystem Service Procedure [73]
- B Corp Certification [114]
- Blue Mark [115]

Further resources that can support with design and measuring impact metrics, as well as providing guidance on impact reporting, include:

- IRIS+, an initiative driven by the Global Impact Investing Network (GIIN) – the database has some specific forestry indicators e.g. forest management plan implementation and area reforested.
- Joint Impact Model [116] – although there are no forest sector specific indicators (CO_2 emissions from forestry and land use change are explicitly not included), however employment indicators could be useful.
- Global Reporting Initiative (GRI) Standards – sector specific guidance available for agriculture but not forestry.

Where impact measures are part of certification (e.g. carbon credits) then the relevant impact reporting protocols should in most cases be developed and overseen by a specialist. Even when impacts are being measured outside forest carbon projects, it is important to collect data accurately and transparently, applying the correct analysis and interpretation. Substantial amounts of satellite data on land use change are now available which can allow projects to demonstrate impacts on the landscape

An example of mosaic planting in Tanzania.

IMPACT GENERATION

over time. This data can also be useful for investors to monitor project progress remotely. Specialists are required to interpret and analyze the data correctly.

Calculating carbon mitigation, i.e. emissions reductions and carbon stored in tons of CO2 equivalent, can be roughly estimated when it is not financially viable to undertake full carbon accounting and where approximate carbon estimates per unit area are available in the literature for the relevant forest type. Calculations in this way are not suitable for generating credits and methodologies (including conversion factors used) should be clearly reported.

Biodiversity metrics are challenging to measure. eDNA techniques can provide information on species diversity at sites, although it is still a relatively expensive technique and does not provide information on species abundance. Working with local specialists to identify indicator species could help a project develop a proxy for habitat health and biodiversity. Concentrating on measuring the population of a single species is more cost effective than attempting a direct measure of biodiversity.

Box B9 (expanded in Annex B1) shows a menu of potential environmental impact metrics.

Box B9: Examples of environmental impact categories

- Carbon mitigation, adaptation and resilience
- Biodiversity conservation and habitat restoration
- Soil protection and health
- Water quality and availability, including watershed management
- Air quality
- Access to and availability of non-timber forest products
- Ecosystem connectivity across a landscape including wildlife corridors

Many social impacts are complex to measure in detail. Projects can measure and report on aspects under their control, for example, the provision of training and the payment of wages, however understanding the impact of training or wages on livelihoods requires using social research technique such as surveys or focus groups. Beyond income, human wellbeing is a wider concept which incorporates multiple factors including material, health and emotional wellbeing as can be objectively measured and subjectively experienced. Metrics should be established based on the specific goals, context, and nature of the project. A combination of quantitative and qualitative data collection methods is often used to comprehensively evaluate livelihood impacts. Projects that seek to have significant positive impacts on livelihoods need to incorporate social science expertise from an early stage to develop baseline data and methods for on-going data collection and measurement.

Box B10: Examples of social impact categories

- Income and Employment Generation
- Poverty Reduction/ Asset Accumulation
- Food Security and Nutrition/ Health status (including mental health)
- Market Access and Value Chain Integration
- Quality of Life/Perceived well-being
- Empowerment and Gender Equity

Box B10 (expanded in Annex B1) shows a menu of potential social impact metrics.

THE ENVIRONMENTAL PERSPECTIVE

13.1 Summary of potential environmental risks

Many of the environmental risks associated with forestry are similar to those faced by other projects with a large land footprint e.g. agriculture. However, there are significant forestry-specific topics to address, including:

- HCV assessments – these are required for FSC certification, and given the large land footprint of forestry projects, it is expected that some areas of HCV would be present in many projects. HCVs within the project area must be maintained or enhanced to meet FSC requirements.
- Critical habitat identification and management – this is an IFC PS6 requirement and has some overlap with HCVs.
- Landscapes and ecosystem services – forests can play a key role within a wider landscape in a multitude of ways. It is important to consider the role of the project within the landscape, any wider impacts project activities may have beyond the borders of the project area and whether any benefits could be enhanced by considering spatial planning though a landscape lens.
- Biodiversity – tropical forests are the most biodiverse terrestrial ecosystems, and collectively forests harbor the majority of the world's biodiversity. It is important to consider how project activities will affect biodiversity and take adequate precautions.
- Land use change – some projects, such as plantations or ARR projects, result in a land use change. It is important to adequately assess the environmental impact of a land use change, including on biodiversity, and ecosystem services. Where an existing area is found to contain natural or critical habitat, or HCVs, the area should not converted to a different land use type.
- Use of pesticides (including herbicides) and fertilizers – any project that involves

An HCV Study engages a local community in Sierra Leone

THE ENVIRONMENTAL PERSPECTIVE

planting trees may use pesticides and fertilizers. Even natural regeneration projects may require invasive species control through targeted used of pesticides and support from fertilizers during the establishment phase. All chemicals should be used and stored in a manner that is compliant with IFC PS3 and the appropriate EHS Guidelines.

13.2 High Conservation Value Assessments

The High Conservation Value (HCV) approach was initially developed by FSC in 1999, and has since become an approach that can also be applied independently of FSC and incorporated into other standards such as the Roundtable on Sustainable Palm Oil (RSPO). Whilst the HCV concept was originally conceived in relation to forests, any ecosystem type or social asset can be assessed through this approach and the project should assess all ecosystems within their project area.[39]

An HCV is a biological, ecological, social, or cultural value of outstanding significance or critical importance. An area is considered an HCV if it sits within one or more of the following HCV categories [117]:

1. **Species diversity** – Concentrations of biological diversity including endemic species, and rare, threatened or endangered species, that are significant at global, regional or national levels.
2. **Landscape-level ecosystems, ecosystem mosaics and Intact Forest Landscapes** – Large landscape-level ecosystems, ecosystem mosaics and Intact Forest Landscapes (IFL) that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.
3. **Ecosystems and habitats** – Rare, threatened, or endangered ecosystems, habitats and refugia.
4. **Ecosystem services** – Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.
5. **Community needs** – Sites and resources fundamental for satisfying the basic necessities of local communities or Indigenous Peoples (for livelihoods, health, nutrition, water, etc), identified through engagement with these communities or Indigenous Peoples.
6. **Cultural values** – Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or Indigenous Peoples, identified through engagement with these local communities or Indigenous Peoples.

Box B11: Intact Forest Landscapes

An IFL is an unbroken expanse of natural ecosystems within the zone of current forest extent, showing no signs of significant human activity and large enough that all native biodiversity, including viable populations of wide-ranging species, could be maintained.

Although all IFL are within the forest zone, some may contain extensive naturally tree-less areas, including grasslands, wetlands, lakes, alpine areas, and ice. An IFL is larger than 500km2, at least 10km wide at the broadest place and at least 2km wide at corridors or appendages [118]. FSC have developed specific guidance for Forest Managers related to IFLs [119].

[39] The High Conservation Value Resource Network (HCVRN) has developed guides for HCV assessment and HCV and High Carbon Stock (HCS) assessments. They also train and accredit HCV assessors.

THE ENVIRONMENTAL PERSPECTIVE

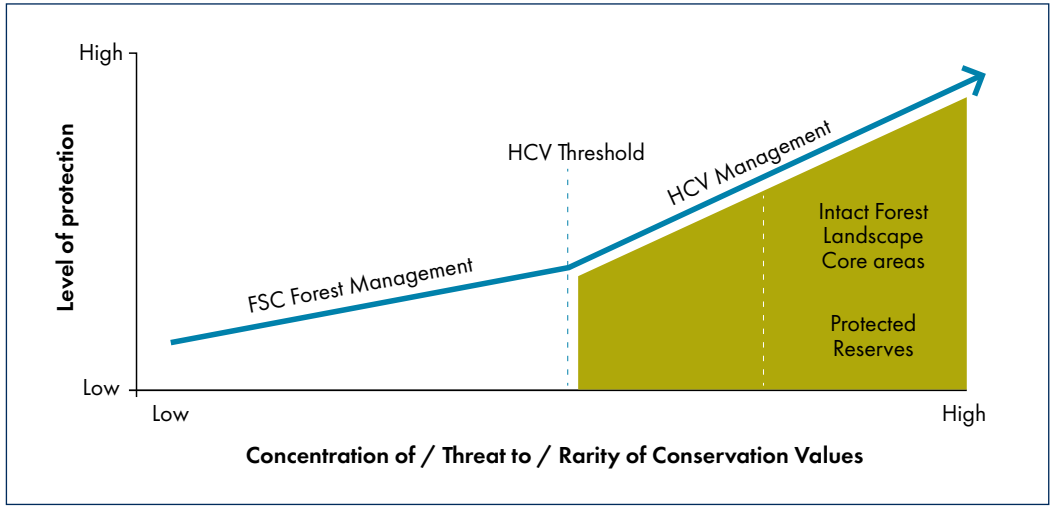


Figure B4: Relative protection required for Conservation Values. [120]

FSC certification requires HCVs to be maintained and/or enhanced within the project area through applying the precautionary approach[40]. Management of HCVs is a risk-based approach, with the level of protection increasing with the concentration of, threat to and/or rarity of, HCVs (figure B5).

13.2.1 HCV National Interpretations

Since the generic guidance regarding the six HCVs includes terms such as "significant", "critical" and "concentration", the precise definition of HCVs can vary between countries. HCV National Interpretations are documents that adapt the guidance to the specific country context. Most of the existing national interpretations are focussed on forests. As an example, countries with large areas of undisturbed forest (e.g. Canada) will interpret HCV 2 differently to countries with few remaining forest patches, all with some level of human disturbance (e.g. Ghana).

13.2.2 HCV Assessments

An HCV assessment is required by FSC as part of the initial assessment phase of the project. The results of the HCV assessment should feed into the planning of the project, with any areas identified as HCV managed appropriately, i.e. conserved and protected. Generally external experts are used to undertake HCV assessments, particularly for projects that meet the requirements for a more intensive assessment (figure B4).

HCV assessments are governed by the scale, intensity and risk of project activities (see figure B5). Assessments should involve engagement with rights holders, affected and interested stakeholders, local communities and Indigenous Peoples.

FSC group certification for out growers and smallholders allows HCV assessments to be developed for the group through a single assessment.

For small farmers, FSC requirements regarding HCVs can be a contributing factor to not pursuing the certification, since setting aside considerable portions of land for protection on small farms may result in the growing area being too small to remain financially feasible. Given the considerable overlap between HCVs and critical habitat (see Section 13.6.1) this may also be an issue for IFC PS compliance.

[40] The precautionary approach is an approach requiring that when the available information indicates that management activities pose a threat of severe or irreversible damage to the environment or a threat to human welfare, The organization will take explicit and effective measures to prevent the damage and avoid the risks to welfare, even when the scientific information is incomplete or inconclusive, and when the vulnerability and sensitivity of environmental values are uncertain.

THE ENVIRONMENTAL PERSPECTIVE

Likely that less intensive hcv assessment is needed		Likely that more intensive hcv assessment is needed
Smaller Scale	**Scale of activities**	**Larger Scale**
• Small-scale operations with small producers • Inputs (e.g. chemical) are relatively low and affect a small proportion of the total area		• Large scale conversion of natural vegetation • Permanent roads exist in most areas of the management area • Pesticides are regularly used in the majority of the management area
Lower Intensity	**Intensity of activities**	**Higher Intensity**
• Planted areas are mostly mixtures of native species • Products are extracted to roadside by cable, by hand or by animals • Hunting, trapping and fishing occur rarely or in only a few restricted places • Grazing or browsing by domestic animals occurs rarely or in only a few restricted places • All or most of the natural ecosystems are designated as conservation areas, while intensive activities are limited to abandoned agricultural areas etc.		• Planted areas are mostly mono-specific and/or exotic species • Products are extracted to roadside with heavy machinery • Much of the area contains permanent roads and is visited by vehicles regularly • Hunting or trapping occur in most of the management area • Grazing or browsing by domestic animals occursb in most of the management area • Substantial abstraction of water and/or modification of downstream hydrologic flows • Modification of lateral or longitudinal hydrologic connectivity (e.g. levee construction, impoundments)
Lower Risk	**Overall risk of activities** based on scale and intensity of activities and the vulnerability level of hcvs	**Higher Risk**
• Based on the literature, prior assessments, expert opinion, and stakeholder input, there is a very low likelihood that HCVs are present in the production site or in its larger area of influence • An organization chooses to presume the presence of HCVs, based on a possibility of their presence, as identified by stakeholders, specialists or available literature		• Based on the literature, prior assessments, expert opinion, and stakeholder input, there is some likelihood that HCVs may be present in the production site or in its larger area of influence • Some of the HCVs are especially vulnerable • Some of the hunted animals are known to be key pollinators or seed-dispersers • Some of the RTE species are highly dependent on undisturbed habitats • Natural habitats in this region are already highly fragmented • Soils on steep slopes are prone

Figure B5: HCV assessment requirements vary with scale and intensity. [120] When the scale of activities is large, when the intensity of activities is high, or when at least some of the HCVs are especially vulnerable, then the risks to HCVs are high. Based on this logic, more detailed HCV assessments and/ or protective measures are needed to avoid unacceptable impacts. These examples are a small selection of the very many ways of scoring the scales and intensities of activities and impacts. Areas containing natural vegetation (native species) have a higher probability of containing HCVs 1-3. Areas occupied or regularly used by local people have a higher probability of containing HCVs 4-6.

THE ENVIRONMENTAL PERSPECTIVE

13.2.3 Monitoring of HCVs

Under FSC req uirements, projects must undertake periodic monitoring to assess changes in the status of HCVs and adapt HCV management if needed.

13.3 Species and habitats assessment

Species and habitat assessments should be carried out as part of a project's Environmental and Social Impact Assessment (ESIA), and should be compliant with IFC PS6 and, if FSC certification is targeted, FSC Principle 6 and HCV requirements. See Section 13.6 for a detailed comparison of PS6 and HCV.

Desktop tools for high-level screening of species and habitats can be used to give an indication of what a full assessment may show. Tools to support desktop assessments include Global Forest Watch [121], and the Map of Life [122]. Global conservation priority sites, for example Key Biodiversity Areas [123], Important Bird Areas [124], biodiversity hotspots [125] etc have been mapped and can help to indicate whether a project may be sited in a biologically sensitive area. Many of these are included in Global Forest Watch. Local country websites can also be useful e.g. GEF-Mozambique [126].

Generally, specialists in the particular ecoregion will be used to undertake in-depth species and habitat assessments.

Box B12: Change in HCV status over time

A forestry project in Sub-Saharan Africa undertook vegetation mapping before starting operations and decided, independent of an HCV assessment, to set aside natural grassland and corridors of degraded forest to protect for conservation, with improvements observed in both the forest and grassland areas as a result of protection. Since project operations began, there has been a reduction in natural areas within the landscape outside the project boundaries which has resulted in the project's conservation areas becoming important refugia for local wildlife. As a result of both the improvement in habitat and the importance of the conservation areas within the wider landscape, an HCV reassessment now considers the conservation areas to all meet HCV status since they are critical to local biodiversity. The company has since developed a bespoke management plan for the areas.

Box B13: Plantations as HCV

In some instances, plantations themselves can be considered as HCV when they provide an important function. One example are the plantations providing a buffer around a national park in Rwanda. These plantations form both a physical buffer between farmland and the national park, and also provide local communities with wood products and livelihoods. As a result they function as a key part of the protection strategy for the national park, an intact forest landscape of significant biodiversity importance. In this instance, maintaining the plantation's function as an HCV mean maintaining it as an operating plantation that continues to provide services to the local communities and reduces pressure on the national park.

THE ENVIRONMENTAL PERSPECTIVE

Assessments should take into account seasonal use of habitats.

Advancements in technology can support with species and habitat assessments, in relation to remote sensing and on-the-ground measurements, as well as data processing. The most accurate assessments use a combination of remote sensing and on-the-ground data collection, alongside stakeholder consultation.

13.3.1 Remote sensing

These technologies are continually becoming more sensitive and more accessible. Satellite data resolutions have increased significantly from 100m resolutions down to 0.5m resolutions, alongside an increase in frequency, with images available as frequently as every 4 minutes. This means that it is now possible, for example, to map specific tree species, illegal deforestation roads, and near real-time monitoring of forests [127]. Remote sensing data can be a cost-effective option for large-scale monitoring and is effective at tracking changes at the ecosystem level.

Satellite data can come from different types of satellite sensors:

- Light detecting and ranging (LIDAR) sensors can provide measurements of vegetation structure using lasers to determine 3D structures, allowing assessments of forest biomass and carbon storage [127].
- Synthetic Aperture Radar (SAR) can be used regardless of weather conditions and during the day or night. This can be particularly useful for monitoring tropical rainforests, where historically cloud cover can limit data availability [127].

Aircraft and drones can also be used to collect remote sensing data, including LIDAR data. This approach can provide more targeted data than satellite data and can provide accurate monitoring of inaccessible areas [127].

13.3.2 On-the-ground monitoring

Best practice involves using on-the-ground, or in situ, monitoring to complement and ground truth remote sensing data. This monitoring can also provide information about biodiversity from the species or genetics level, which remote sensing in generally unable to do.

Improvements in technology that support on-the-ground monitoring include:

- Sensors (including visual, acoustic and atmospheric) can contribute to more automated, frequent and standardized monitoring. In forests, sensor networks can be used to detect fires quickly (within hours) and acoustic sensor networks have been deployed to monitor wildlife populations by recording the calls of target species whilst simultaneously monitoring for sounds of (illegal) human activity (such as gunshots or chainsaws) which can trigger an alert system [127]. Recent advancements in the development of biodegradable sensors may advance the ability to use these types of technology in remote locations [128]. In ecosystems like forests where visibility is limited, acoustic technology to monitor biodiversity can be more effective than traditional methods such as transects.

Outgrower woodlot Sierra Leone

THE ENVIRONMENTAL PERSPECTIVE

- Environmental DNA (eDNA) can enable rapid species inventories to be made from trace DNA released by organisms. Individual species can only be identified where DNA markers for that species have already been identified, however patterns of species diversity and how they change over time can be tracked. Whilst this technology can be used to monitor the presence of hundreds of species through e.g. water samples, soil samples, or even the stomach contents of blood sucking insects like mosquitoes, it is currently still relatively expensive since it requires lab resources that are not always available close to the sites being monitored. A combination of innovation and an increase in popularity is bringing down the cost of eDNA analysis and increasing the speed and comprehensiveness of the assessments [127].
- Citizen science is a fundamental part of on-the-ground monitoring. Local communities have substantial knowledge about their local environment and the species that live there. Citizen scientists can help in identifying species caught on camera trap images or through acoustic sensing, can identify areas where they have seen species or signs of species, and provide information about changes to species ranges etc.

13.3.3 Data processing

Alongside data collection advances, there have been significant improvements recently in data processing, allowing larger datasets to be analyzed faster and more comprehensively. These advances include using AI to analyze data from satellites, drones, or on-the-ground sensors, such as camera traps or acoustic sensors [127].

13.4 Landscapes and ecosystem services aspects

Forest projects tend to have a large land footprint and therefore can play a significant role within the wider landscape. If a project is within a landscape where a landscape partnership has developed a spatial plan at the landscape scale (through a landscape approach, see Section 6.6) then the project should align with the plan. Stakeholder mapping should identify the existence of a landscape partnership if is it there, and where possible, active involvement of the project proponent in the partnership is likely to be beneficial to many aspects of the project e.g. stakeholder engagement, and understanding positive impacts.

Where such landscape plans do not exist, it is still possible to understand the impacts of the project within the broader context through a landscape lens. Forestry projects should consider the impacts their activities may have beyond their boundaries, this may include:

- Water availability – this is particularly important to consider for plantation projects, especially greenfield projects or where the plantation species changes. With proper sustainable forest management planning and site-species matching projects can minimize the impact of their activities on water, both in rivers and streams as well as the water table (or in some cases demonstrate positive impacts). However, with climate change increasing the frequency and severity of extreme weather events including droughts, the impacts of project activities on water should be considered. Note: water assessments can be complex to design and costly.
- Water quality – projects can have an impact where erosion causes sedimentation and siltation of water, and harvesting residues can pose risks during flood events and clog waterways with excessive biomass. Further where projects use pesticides and fertilizers, run off to waterways is a risk, and one which may have impacts beyond the

THE ENVIRONMENTAL PERSPECTIVE

project boundaries. Responsible use of these chemicals should minimize the risk (see Section 13.5), however considering the potential impacts through a landscape lens can ensure adequate mitigation measures are put in place.

- Fire – forest fires are a risk to most forestry projects, and, as with impacts on water availability, this risk has become more severe with climate change [130]. This risk should be considered from the landscape perspective, both in terms of fires starting within the project area affecting surrounding areas, and fires from outside travelling into the project area.
- Biodiversity – by taking a step back and considering the project area in the context of the broader landscape, opportunities such as improving connectivity between ecosystems, including riparian habitats, may be identified and can be incorporated into project planning, thereby maximizing the impact potential of the project on biodiversity.
- Human-wildlife conflict (HWC) – forestry projects, particularly those that involve natural forest restoration or reforestation with native species, can improve the diversity and abundance of wildlife that the forest supports. Whilst this is positive environmental benefit, it is important to consider the potential impacts on local communities beyond the project boundaries as conflicts between people and wildlife may also increase. HWC takes a variety of forms, from birds and monkeys and other similar species eating fruits from orchards to elephants destroying crops and large carnivores killing livestock or, in the worst cases, people. Mitigation measures, such as providing training for local communities in strategies to reduce conflicts, can help to reduce HWC incidents.

Box B 14: Addressing human-tiger conflict

A peat swamp forest carbon project in Indonesia is restoring an area of over 20,000 hectares which was previously drained and logged for the pulp and paper industry. The area has one relatively small patch of remnant peat swamp forest which has been a refuge for many forest species, including critically endangered Sumatran tigers. As the peat swamp is reflooded and reforestation efforts are beginning to recover the forest, wildlife is returning across the project area, monitored using camera traps. In order to address the risk of an increase of human-wildlife conflict with an increase in tiger numbers, the project undertook human-tiger conflict mitigation training, providing local communities with information about tigers and strategies to reduce conflict.

Clonal hedges in a commercial timber plantations. Selective cloning can be used to improve tree quality, growth rates, and resistance to pests.

THE ENVIRONMENTAL PERSPECTIVE

13.5 IFC PS-3 Resource Efficiency applied to forestry

The risks under IFC PS-3 related to forestry can be considered broadly similar to those of large-scale agriculture projects. Alongside the General EHS Guidelines, the following EHS Guidelines can be relevant to forestry projects:

- EHS Guidelines for Perennial Crop Production [130] - relevant to any project that involves planting trees
- EHS Guidelines for Forest Harvesting Operations [13] - relevant to both plantations and sustainable forest management in natural forests
- EHS Guidelines for Sawmills and Manufactured Wood Products [14]
- EHS Guidelines for Pulp and Paper Mills [131]
- EHS Guidelines for Board and Particle-based Products [132]

13.5.1 Pesticides

Growing trees, whether it is to develop a plantation or as part of an afforestation or reforestation project, generally is done with the support of pesticides.[41] Applications of pesticides can be used to clear land ready for planting, to control competing plants until the trees form a canopy (approximately 2-4 years), and to manage invasive alien species thereafter. Even when restoring an area of natural forest with native species, pesticides may be used, where necessary, to initially manage competition with saplings and to remove invasive species. Projects involving management of existing natural forest will have minimal, if any, use of pesticides.

In order to reduce pesticide use, projects can use integrated pest management (IPM), including selective cloning of individual trees that are resistant to certain pests. FSC requires projects to apply IPM. IFC PS and EHS Guidelines recommend it. Higher costs of commonly used pesticides in recent years have resulted in more efficient use to minimize volumes required. Using pesticides for land clearance and to control competing plants may reduce soil disturbance which reduces the risk of carbon emissions from the soil and erosion. Some manual weed control is also possible, and generally projects will use a mixture of methods depending on the situation. Using selective pesticides rather than broad spectrum ones can target specific problematic species more effectively.

Appropriate spatial planning of a plantation will prevent the planting of trees on wetland areas or riparian zones, which in itself reduces the impact of pesticides on waterways. Best practices include the use of pesticides in accordance with the World Bank Group General EHS

Table B4: Comparison of IFC PS-3 and FSC approach to hazardous chemical use

Category	IFC PS-3	FSC
Compliance with national regulations and international conventions related to hazardous chemicals (Stockholm, Rotterdam, Basel and Montreal)	Yes Stockholm, Rotterdam and Basel are explicit.	Mostly, Basel convention is not mentioned
WHO Class Ia (Extremely hazardous) & Ib (Highly hazardous)	Prohibited	Some prohibited, some restricted
WHO Class II	Requires adequate management and use	Approval needed, must be in line with IPM and risk assessment undertaken

[41] Pesticides includes herbicides, fungicides, and insecticides.

THE ENVIRONMENTAL PERSPECTIVE

Box B15: Glyphosate in forestry

Glyphosate is the most widely use herbicide globally, and it is commonly used in forestry. Whilst glyphosate is categorized by WHO as Class III (slightly hazardous), it has been the subject of considerable debate in recent years, with numerous countries, states, counties, and cities restricting its use or even banning it altogether.[42] Currently, in the EU, glyphosate is permitted under a temporary registration. This registration is valid until December 15, 2023.

Guidelines, and the World Bank Group EHS Guidelines for Perennial Crop Production, which help to reduce EHS risk.

FSC has a list of highly hazardous pesticides [133] which categorizes pesticides as prohibited, highly restricted and restricted. This list is regularly updated. IFC PS-3 relies on the World Health Organization (WHO) Recommended Classification of Pesticides by Hazard [134] and, on paper, is more restrictive than FSC. FSC requires justification and approval of all pesticide use through a risk assessment process, which means, in practice, FSC is generally aligned with IFC PS-3. The two approaches are compared in Table B4.

Note – the WHO classification covers all pesticides regardless of intended use, whereas the FSC highly hazardous pesticide list only considers pesticides used in the forestry sector.

Counterfeit pesticides can be a risk within the forestry sector, as with the agricultural sector. A robust procurement process should be in place to manage this risk.

13.5.2 Fertilizers

Fertilizers are generally used once during a growing cycle when the trees are planted. Soil assessments and the needs of the tree species being planted can be used to understand what type of fertiliser, if any, is needed to support tree growth. Some fertilizers can be applied as a tablet that is buried alongside the saplings. This method minimizes risk of fertiliser run off. FSC requires monitoring of all fertiliser use.

13.5.3 Soil & Water Management

Soil and water management are important for projects that involve planting trees – plantations, afforestation and reforestation. A key consideration when planning a plantation is site-species matching, i.e. ensuring that the conditions (soil, climate, etc) are suitable for the species the project intends to grow. Poor site-species matching can have considerable financial implications for a project, as well as the potential for causing environmental harm e.g. by depleting water availability.

Soil surveys allow a project to generate a map of soil types across their site, and, alongside topography, identify areas

A sawmill in Tanzania

[42] A full list can be found here https://www.wisnerbaum.com/toxic-tort-law/monsanto-roundup-lawsuit/where-is-glyphosate-banned-/ [146]

which are suitable for planting, and those which should be set aside as unsuitable for plantation trees. These areas include riparian areas, wetlands, and rocky sites, as well as any HCVs identified through an HCV assessment (see Section 14.2).

Erosion of topsoil can not only affect soil health and emit carbon to the atmosphere but can also result in an increase of sediment in waterways. Best practice to minimize erosion is to disturb the top layer of the soil as little as possible and maintain grass cover once saplings are tall enough not to be in direct competition with the grass.

There are concerns that plantations can have a negative impact on water availability, however by planting appropriate species for the location this should not be the case. However, a baseline hydrological survey and regular monitoring thereafter can allow the project to confirm that their activities are not depleting water resources, and/or alter their activities if there is a negative impact on water.

13.5.4 Sawmills and Wood, Pulp & Paper Processing

The EHS Guidelines cover the main risks regarding sawmills and processing for timber, pulp and paper. They contain specific guidance related to wastewater, air emissions, waste, hazardous materials, noise and fire. For IFC PS-3 compliance, projects should follow these guidelines.

13.6 IFC PS-6 Biodiversity applied to forestry & critical habitat

IFC PS-6 applies to modified and natural habitats. Critical habitats are a sub-set of natural habitats. These are defined below[43]:

- **Modified habitats** are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition. Forest plantations are considered modified habitats.
- **Natural habitats (NH)** are areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition. Areas of natural forest would be considered NH.
- **Critical habitats (CH)** are areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered species; (ii) habitat of significant importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes. Areas of primary forest would generally be considered to be CH.

If an area has been modified in anticipation of the project, the original habitat type should be used for IFC PS-6 assessments.

Specific considerations for forestry projects are:

- Plantations on greenfield sites should assess the existing habitat type. Grasslands can be NH (or even CH) if they meet the definition above. If so, and conversion of the site is considered to be unavoidable, offsets in order to meet 'no net loss' (NH) or 'net gain' (CH) biodiversity requirements may affect the project's financial viability. NB. Conversion of such sites may prevent the project achieving FSC certification.
- Projects that harvest timber from natural forest, i.e., NH, will need to demonstrate no net loss of biodiversity. In order to do this, a baseline biodiversity assessment is required.

[43] See IFC PS-6 [12] for full definitions.

THE ENVIRONMENTAL PERSPECTIVE

- Selective logging from natural forest can, over time, alter the composition of the forest (e.g. if one particular species is targeted for harvest) which would convert the habitat from NH to modified habitat. Mitigation actions such as SFM and supporting regeneration of the harvested species could help prevent any shift in species composition from taking place.
- Many species used for plantations (e.g. eucalyptus) are alien species in the project area. If the species already exists in the country or region then using it, in accordance with the existing regulatory framework, is in compliance with IFC PS-6. If not, then additional considerations relating to potential invasiveness of the species is required. Some plantation species can become invasive if not managed properly. Their spread outside designated plantation stand areas needs to be monitored and controlled e.g. into areas of natural forest set aside as HCV. This can be particularly challenging when working with outgrowers or smallholders who may be inexperienced in forestry and the risks associated with invasive species.

Box B16: What is the difference between 'no net loss' and 'net gain'

IFC PS-6 [12] defines these terms as follows:

- 'No net loss' is the point at which project-related impacts on biodiversity are balanced by measures to avoid and minimize the project's impact, to undertake on-site restoration and then to offset significant residual unavoidable impacts, if any, on an appropriate geographical scale (e.g. local, landscape-level, national, regional).
- 'Net gains' are additional conservation outcomes that can be achieved for the biodiversity values for which the critical habitat was designated. Net gains may be achieved through the development of a biodiversity offset and/or in some circumstances (see IFC PS-6 guidance note) through the implementation of programmes that could be implemented in situ to enhance habitat, and protect and conserve biodiversity.

Both of these allow for some biodiversity loss in one area provided it is offset or improved in another area to compensate. Both require detailed planning but experts skilled in the relevant environment.

13.6.1 Comparison between IFC PS-6 and HCV

There is considerable overlap between IFC PS-6 and the HCV approach, however the requirements of PS6 are more onerous, with key differences relating to spatial scope, thresholds for identifying priority areas and ecosystem services, and management of non-critical biodiversity. Table B5 compares the two approaches.

It is important to note the FSC requires environmental protection measures beyond the maintenance and enhancement of HCVs. These are incorporated in FSC Principle 6 and include representative sample area set asides, no conversion, riparian buffers, ecological value regeneration and conservation. This table considers IFC PS-6 and HCV only.

THE ENVIRONMENTAL PERSPECTIVE

Table B5: Comparison of IFC PS-6 and HCV requirements.
Adapted from TBC (2018) HCV and IFC PS6: why do the different approaches matter to industry? Industry Briefing Note of The Biodiversity Consultancy, Cambridge, UK [135]

Component	IFC PS-6	HCV
Types of biodiversity features	CH and NH as defined above.	HCVs 1-3 include rare and threatened species, ecosystems and landscapes, protected areas and internationally recognized areas, plus recognition of landscape-level ecosystems, even if not intrinsically rare or threatened. NH in its own right is not explicitly captured in HCV.
Spatial scope	Identification of biodiversity values, ecological processes and impact assessment should be undertaken at an 'ecologically relevant scale', i.e. for forestry projects, at the landscape scale.	In practice the focus of HCV identification is often at the project or concession level. Considerations of IFLs and HCV 2 do encourage a broader approach.
Quantities of biodiversity features	CH: Global quantitative thresholds exist for most categories e.g. habitat of significant importance to Critically Endangered and/or Endangered species as per IUCN Red List of Threatened Species or national/regional lists. No threshold for NH, identification can be subjective.	Global guidance is qualitative – focus on exceptional biodiversity with no global objective threshold. Where HCV National Interpretations exist, more explicit guidance can be included but level of detail is variable.
Mitigation hierarchy	Fundamental component of IFC PS application. Offsets can be used where necessary.	No specific mention of mitigation hierarchy in HCV guidance. Focus on avoidance and minimization of impacts, no explicit mention of offsets.
Impacts for identified features	Avoid as far as feasible. Unavoidable impacts on CH acceptable if no 'measurable adverse impact' and 'no net reduction' in species populations. Unavoidable impacts on NH acceptable.	Some impacts may be acceptable if overall the value is maintained or enhanced.

THE ENVIRONMENTAL PERSPECTIVE

Table B5: Comparison of IFC PS-6 and HCV requirements.
Adapted from TBC (2018) HCV and IFC PS6: why do the different approaches matter to industry? Industry Briefing Note of The Biodiversity Consultancy, Cambridge, UK [135]

Outcomes for residual impacts	Net gain for CH. No net loss, where feasible, for NH.	HCVs should be maintained or enhanced.
Monitoring	Required – burden of proof is on the project to demonstrate effective mitigation and should feed into adaptive management. More rigorous biodiversity monitoring required for CH.	Required – in proportion to the scale, intensity and risk of management activities, and should feed into adaptive management.
Precautionary approach	Implicit	Explicit
Ecosystem services	Identification of 'priority ecosystem services' required. If impacts are predicted, mitigation measures should be implemented following the mitigation hierarchy. Explicit mention of services on which the project is dependent. Limited guidance provided on identification or definition of 'priority'.	HCVs 4-6 explicitly concern ecosystem services including the identification of critically important regulating, provisioning and cultural services. Only refers to services used by other people and not the project. Guidance on how to identify services 'critical' to needs or 'fundamental' for identity is limited.
Protected areas (PAs)	Project needs to demonstrate compliance with national regulations if operating in a legally protected area, or internationally recognized area (IRA). PAs and IRAs are indicators of the potential presence of CH.	PAs and IRAs are considered indicators of HCVs. Some national interpretations include PAs and IRAs as HCVs. IFLs specifically mentioned in relation to forests.
Invasive Alien Species	Projects will not intentionally introduce invasive alien species. Project will attempt not to spread invasive alien species which were present pre-project.	Not considered in the HCV framework. For FSC, included in Principle 10.3: The organization shall only use alien species when the knowledge and/or experience have shown that any invasive impacts can be controlled and effective mitigation measures are in place.

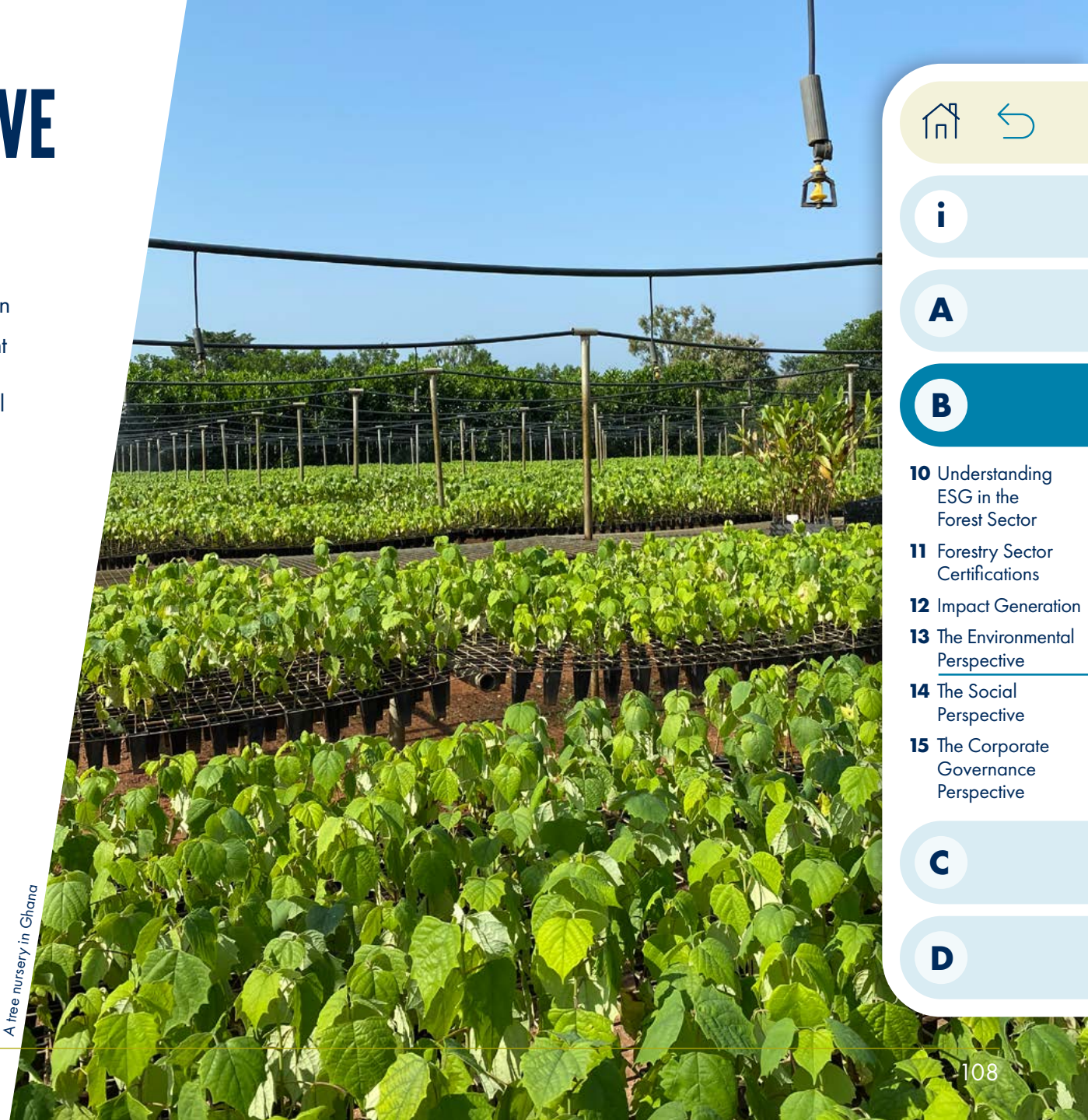
THE ENVIRONMENTAL PERSPECTIVE

13.7 Environmental considerations for plantations

The potential environmental risks associated with plantation forests are complex, and a source of concern to investors and other stakeholders. Key concerns relate to impacts on biodiversity, soil fertility and availability of water. However, against the background of increasing demand for wood products (including to substitute for plastics) and pressure on land caused by agricultural expansion and urbanization, plantations offer the opportunity of contributing to meeting needs for wood and wood products while releasing pressure from logging activities on naturally regenerating forests.

Monoculture plantations, not undertaking a SFM approach, are widely recognized as unsustainable. Good practices in relation to plantation projects include:

- Compliance with the IFC Performance Standards and related EHS Guidelines
- Achievement of FSC or PEFC certification
- Owners and managers with commitment to high standards of ESG performance and supported by in-house and external experts with relevant experience
- Forest management plans that include:
  - Species diversity and conservation of natural areas
  - Water availability and stress assessments, water use planning and monitoring that demonstrates no adverse effects on water availability for other land users
  - Commitments to develop and implement biodiversity impact monitoring and to adaptative plantation management as needed based on the results of monitoring.



A tree nursery in Ghana

THE SOCIAL PERSPECTIVE

14.1 Introduction

Alongside positive impacts, forestry projects can present negative social impacts and risks. IFC PS 1, 2, 4, 5, 7 and 8 are relevant to assessing and managing these risks, as are the social elements of forest-sector certification standards. This section discusses social risks and identifies forest-sector specific risks to be considered in applying the IFC PS and other sector standards. It also briefly discusses safeguarding issues relevant to the sector. There are a wide range of potential risks related to the social context or impacts of forest sector activities. Subsequent sections explore in more detail social risks in the context of IFC PS 1, 2, 4, 5, 7 and 8. The focus throughout is on considerations that are specific to the forest sector. Annex B2 summarizes potential social risks related to different forestry activities.

14.2 Assessing and managing social risks and impacts

14.2.1 Introduction

IFC PS1 sets out requirements for assessing and managing environmental and social impacts, including substantial requirements for engagement with potentially impacted communities and other stakeholders; for grievance mechanisms[44] and for environmental and social management capacity in projects. These are directly relevant to forest sector projects. Specific additional considerations related to the forest sector include the following.

- Where projects stretch across large areas they may interface with many communities. This can make the task of mapping stakeholders and establishing communications time consuming, expensive and difficult. Sufficient time, budget and human resources needs to be allocated to this at an early stage of project planning and stakeholder maps, as well as the effectiveness of stakeholder engagement for both the project and communities, regularly reviewed.
- Forest sector projects can result in long-term and largely irreversible change in land use and landscape that can potentially affect communities positively and negatively. It is important that, even where not required by local legislation, projects have a thorough understanding of the existing social situation, ideally through conducting a baseline social survey such that over time it is possible to measure impacts and adapt project management where needed to avoid negatives and enhance positives.

[44] All forestry standards require the implementation of a grievance mechanism, all standard requirements are aligned with the IFC PS guidance which has more detail on timelines and use of mediators when required.

THE SOCIAL PERSPECTIVE

FSC, CCB and Gold Standard certification standards include requirements for identifying social risks and for stakeholder engagement broadly comparable to PS1.

- FSC requires certified entities to engage with stakeholders in a participatory and inclusive manner, including Indigenous Peoples, local communities, workers, forest owners, businesses, NGOs, etc. An annual stakeholder identification process is necessary, alongside records of meaningful engagement.
- CCB requires that stakeholder identification and analysis includes assessment of rights, interest and relevance to the project for each stakeholder group and for projects to define 'affected communities'. Projects must provide a map showing the boundaries of communities and current and proposed future project areas; document processes, results of information sharing and consultation and community involvement in decision making on the project [136].

- Gold Standard requires two rounds of stakeholder engagement before a project is certified, and annual updates on on-going engagement [137]. A guidance document provided detailed information about undertaking engagement including planning meetings and enabling participation form women and vulnerable groups. The guidance includes a case study. Gold Standard also has a template to be used for reporting stakeholder consultation.
- CCB includes requirements for the people and skills necessary to implement projects, including skills in community engagement [136].

It is important to consider community use of land when developing a forest sector project. Projects can incorporate use of the forest by local communities, e.g. for collection of NTFPs or using a route through forest areas to get from one side of the project to the other. However, considerations need to be made regarding community health, safety and security (See 14.4) and how any project activities may have an impact on forest use by local communities.

14.3 Labor and working conditions

14.3.1 Introduction

IFC PS2 addresses three aspects of labor and working conditions:

- working conditions, e.g. recruitment, contracting, working hours;
- human rights aspects, i.e. child labor and forced labor;
- health and safety at work.

IFC PS2, the related Guidance Note and the IFC Handbook for labor and Working Conditions provide detailed guidance applicable to all sectors [138].

Forest sector certification standards cover some but not all of these aspects. Forest specific risks and their treatment in sector certifications in relation to each of these aspects are discussed below.

THE SOCIAL PERSPECTIVE

Key labor and workforce aspects of forest sector projects include the following.

- The sector is often a large employer of low-paid and often unskilled labor, including (internal) migrant workers, and contract workers.
- Working hours can be long.
- Across the globe, forestry (along with agriculture, fishing and hunting) has high fatality rate, e.g. the US National Safety Council lists the sectors as having the highest fatality rate per 100,000 workers [139].
- Distances to working locations can be long, increasing road safety risks and making emergency response a challenge.
- Agrochemicals used in the sector include those classified by the World Health Organization (WHO) as being 'extremely hazardous' (Class Ia) or 'highly hazardous' (Class Ib).

Box B17: Raising standards of contractors

Many plantation companies in sub-Saharan Africa are moving to a model of using contractors to perform most forestry tasks, including higher risk ones, e.g. harvesting. Due to the under-development of the sector in many countries, contractor workers are often entry-level and have rarely worked for companies following best international practice. This results in an increased risk of health and safety incidents, labor and human rights breaches and reputational risks.

To mitigate the risks, as well as increase productivity and quality of contractors some of the following initiatives have had positive results:

- Develop and implement a 'Third-party policy and management plan', including provisions for change management.
- Include specifications for ensuring that contractors are reputable and legitimate and have an appropriate ESMS in accordance with PS2.
- Apply a reasonable, risk-based, due diligence process to vet suppliers and rigorously monitor and audit contractor performance including on E&S.
- Ensure that contracts with suppliers include commitments to ESG and a Code of Conduct
- Encourage quality training of contractor workers, through reputable suppliers. Where possible, integrate this with the internal staff training regime to minimize costs and ensure consistency.

Consider working with local academic institutions and NGOs to assist with building the capacity of contractor workers.

- In many developing countries there is a shortage of sector-specific training, (e.g. chainsaw operators).
- In rural and remote settings the project may be workers' first formal employment.
- Projects may include providing accommodation for workers on a long-term basis or temporarily, for workers involved in planting, pruning or harvesting.
- Unions may not exist to represent workers, or not be active in rural locations.
- Forestry workforce tends to be predominantly male, with women employed in limited roles (e.g. office roles, nursery and certain types of processing).

THE SOCIAL PERSPECTIVE

Box B18: Women in the forestry workforce in Africa

An African plantation project who was committed to achieving 2X compliance started a journey of four years to double the female representation on the workforce over five years.

The company started by analysing current employment patterns and identifying blockages to female employment, during this process it was found that there was cultural discrimination against women with some managers stating that women were more absent from work. The HR figures showed that on average female employee tenure was higher and absenteeism less, and in many instances production rates higher.

A review of HR policies ensued, to ensure women were gaining the same access to training and promotions, and that where possible, there could be equal representation in the recruitment stage. A female mentorship scheme was started.

The company was expanding their industrial capacity at the time and ensured that 50% of new employees for industry were female. This was achieved by requiring that jobs, where possible, could be accessible to men and women, which is often a blockage in the sector.

Similar schemes have been initiated across forestry projects in Africa with swift and positive results, there should be an acknowledgment that some job roles within the industry may not be culturally appropriate for women (e.g. chainsaw operation and chemical spraying).

14.3.2 Working conditions

Working condition risks in the sector relate primarily to use of seasonal and temporary labor, where workers may not be employed under clear contract terms and working conditions and wages may not meet legal requirements. These risks, and the actions needed to mitigate risks, are similar to those found in other sectors, especially agriculture and construction.

- FSC standards cover broadly the same scope as IFC PS, but lack PS2 requirements relating to retrenchment.
- Carbon standards VCS and CCB have broad requirements relating to the ILO Fundamental Conventions [140] but not in the level of detail of PS2. Gold Standard does not address working conditions.

As in other sectors, some forest-sector projects are making active efforts to increase the number of women in the workforce, often linked to corporate commitments to meet the 2X Challenge [141].

14.3.3 Child and forced labor

Risks of projects, or their supply chains, including child or forced labor are similar to those in agricultural projects. Child labor is an issue that projects including a smallholder component need to explore, especially risks of children being involved in labor on family farms that precludes them attending school; and any employment of children below the applicable minimum age, or involves people under 18 undertaking dangerous work such as carrying heavy loads or working with pesticides. In the plantation and large-scale forestry sectors the minimum age for most jobs is 18 because of inherent hazard. Forest sector certification standards (except VCS which deals only with carbon accounting) require that certified projects comply with the provisions of ILO conventions against child labor [142]; FSC, similar to IFC PS2, sets out in some detail what is required. Where projects are located in areas where reliable evidence of age, e.g. through identification (ID) cards, is

THE SOCIAL PERSPECTIVE

Box B19: Forced labor in a gender diversity programme

Whilst trying to encourage gender diversity at a forestry project in West Africa, communities who were providing seasonal labor for the project were asked to provide a quota of women to work. Following a grievance presented (informally) to the company it became apparent that many of the women were being forced to work by men, often family members, and the women were having to hand over their salaries, i.e. had become victims of forced labor.

This occurred despite numerous safeguards in place (e.g. grievance mechanism, policy to only pay employees directly into their own, verified, bank account). When working with rural and traditional communities it must always be taken into consideration that there will be cultural nuances in place that may lead to situations like this, and that women may not feel comfortable with using a formal grievance mechanism. It is advisable to assess grievance mechanisms for compatibility with cultural gender dynamics and explore options to make it more accessible. This can include less formal channels for registering grievances and complaints, e.g. open door policies, fixed informal meeting times within communities, access to register complaints directly with female employees, women's groups.

not available, it is necessary for projects to determine how they will check the age of workers. For example, working with regional government to assist employees securing formal identification documents.

Risks of forced labor relate particularly to seasonal and migrant workers who might be recruited through intermediaries under terms not fully transparent to the project. Projects have also identified risks arising from the implementation of well-intentioned programmes to provide local employment opportunities. Forced labor may occur when asking community leaders to nominate people for employment, culturally it may be appropriate to send a family member to work involuntarily, and it may be more common for females to be nominated, so caution needs to be taken when setting a quota for specified employees.

These risks apply to both projects producing wood and those producing carbon credits.

14.3.4 Health and safety

The health and safety risks in the forestry sector, and measures to mitigate risks, are well outlined in World Bank EHS guidelines [13] [14] [132]; ILO guidance on safety and health in forestry [143] and FAO's toolbox on sustainable forest management [144]. The specific risk profile of a project depends on its composition and operational methods.

- Plantations; harvesting in natural forest; afforestation, regeneration and forest protection can present health and safety risks related to people working in remote locations; using chemicals; exposed to heat, natural hazards and wild animals (particularly snakes); undertaking hazardous tasks, e.g. tree felling, close proximity to heavy machinery, and remote from emergency responders.
- Sawmills and timber processing are industrial activities with the range of related mechanical, physical and chemical hazards.
- Transport (of people to and from work sites, timber and products) carries risks of accidents.
- Smallholder based projects, e.g. growing trees or livelihood activities in the buffer zones of REDD+ projects, carry health and safety risks, e.g. related to use of chemicals, that can be difficult for projects to identify and mitigate.

THE SOCIAL PERSPECTIVE

Box B20: Building a safety culture

Many forestry companies have struggled to reduce their incident frequency rates, and frequently, when a company is in expansion stage, the rate increases drastically. This is generally related to an increase in hazardous activity (e.g. harvesting and processing), initial forestry activity (e.g. planting and pitting) is low risk, however as work forces increase and operations expand so does the OHS risk profile. Companies aim for a lost time injury frequency rate (LTIFR) of zero, best practice includes the monthly monitoring of the LTIFR against previous years and trend analysis with the aim of ongoing reduction in the LTIFR despite expansion. Successful safety culture change campaigns have deployed interventions such as the following:

- Incentive schemes for safety culture (e.g. awards for best safety suggestions, reporting concerns) and penalties for not reporting observations
- Accessible communication (e.g. in local language, with graphics, through songs, plays and radio programmes)
- Annual safety themes and event (e.g. road safety month, safety award day, safety related competitions)
- Integrating safety performance indicators into mid and senior management incentive schemes
- Integrating safety into all training initiatives
- Enhanced and external high-risk job training (e.g. chainsaw operator training)
- Conducting regular safety culture assessments with employees

Projects need a strong safety culture and leadership that is committed to thorough processes of risk identification, implementation of safe working methods, training, recording, and investigating incidents and accidents, including non-lost time incidents and near misses.

14.4 Community health, safety and security

14.4.1 Introduction

IFC Performance Standard 4 (PS4) recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. In addition, communities that are already subjected to impacts from climate change may also

An Occupational Health & Safety (OHS) training underway

THE SOCIAL PERSPECTIVE

experience an acceleration and/or intensification of impacts due to project activities. It requires projects to:

- anticipate and avoid the potential risks to community health and safety during the project life from both routine and non-routine circumstances, including impacts on soil, water and other natural resources used by communities;
- ensure that the safeguarding of personnel and property is carried out in accordance with human rights principles and in a manner that avoids or minimizes risks to the Affected Communities.

IFC generic guidance on applying PS4 is found in the PS4 Guidance Note [145], which includes, in Annex B a tool for identifying health risks. Detailed guidance on understanding and managing security risks can be found in the IFC Good Practice Handbook on the Use of Security Forces: Assessing and Managing Risks and Impacts [146].

14.4.2 Sources of risk to community health and safety

The potential sources of health and safety risk to communities from forest sector projects are largely similar to those presented by large-scale agriculture projects, and derive from:

- roads and road usage: heavy machinery moving large distances, often on untarred roads and through communities;
- chemical usage: the use of herbicides and fertilizers in close proximity to community-farmed land and water ways;
- land use: where blocks of forestry surround communities and frequently community members need to traverse forest blocks to get from place to place
- exposure to disease: if outside workers brought into a remote area bring new diseases.

In addition, forest sector projects can potentially present risks to community health under the following circumstances:

- if community access to non-timber forest products (NTFPs), especially food products, is prevented or restricted by a project;
- if smallholders plant trees as part of a smallholder scheme at a scale that impacts on their food security.
- if project activities result in larger numbers of conflict species, particularly those that potentially pose a threat to people e.g. large carnivores, snakes.

Community health and safety risks are partially covered in certification standards for the sector:

- FSC is broadly comparable to PS4 with respect to community safety, with an auditable requirement[45] that projects analyze risks to communities, and where a risk is identified, mitigation measures are put in place. Relating to health, FSC Principle 9 on management of non-timber forest products addresses this partially by including the requirement for involvement of local communities in the management of, and decision-making about, NTFP's.
- Projects seeking CCB certification on the community dimension must present baseline information on communities, including on well-being; evaluate if the project zone includes any areas that are fundamental to the livelihood of communities, and show how the project maintains or enhances the high conservation values in the project zone that are of importance to the well-being of communities [136]. CCB 'gold' certification includes requirement to identify, through a participatory process, risks for the smallholders/community members to participate in the project, including those related to food security, and apply mitigation measures.

[45] FSC Principle 4 and related criteria that require certificate holders to contribute to maintaining or enhancing the social and economic wellbeing of local communities [159].

THE SOCIAL PERSPECTIVE

14.4.3 Security

Projects in the forestry sector, as in other sectors, take steps to ensure the security of people and property associated with the project. The security risks faced by each project are project and location specific. Worldwide, and across all sectors, measures taken by projects to provide security can also risk the safety and security of people outside the project, e.g. where security guards use force. These risks gave rise to the Voluntary Principles on Security and Human Rights (VPs). Originally developed for the extractive industries through a partnership between companies, governments and NGOs, these principles set out core steps in security risk assessment and in relations with security contractors and with governments (where governments provide security) to ensure effective security respectful of human rights for projects and communities. The thinking behind the VPs underlies PS4 provisions on security.

In the forest sector, most risks to communities related to project security are similar to those in other sectors, e.g. large-scale agriculture and mining.

- Gaps in security risk assessments such that the assessment focusses only on risks to the project and does not include identifying and avoiding potential risks to the community from project security.
- Security guards who misuse their position to act against the interests of community members, e.g. sexual harassment.

In addition, forestry sector projects may face other specific security related challenges.

- The size of forest projects (e.g. plantation, REDD+) often precludes the use of fences, and project areas may be easily accessed by bad actors engaging in illegal activity. In some locations, this may include organized criminal groups involved in poaching, narco-trafficking or illegal mining and in conflict areas, armed groups.

Box B21: Local law enforcement and REDD+

REDD+ projects entail forest protection and this can often result in engagement of security personnel and/or interaction with local law enforcement. Interactions with law enforcement brings with it a risk of human rights violations. Below are two approaches to addressing this risk.

A REDD+ grouped carbon project in Guatemala employed a number of unarmed forest rangers who patrolled the project area. When illegal activities were identified (e.g. felling trees or trapping wildlife for the pet trade) then project staff reported the incidents to local police, and, if needed, contacted an NGO called Unidad de Protección a defensoras y defensores de Derechos Humanos de Guatemala (UDEFEGUA), and organization that provides comprehensive support to human rights defenders to empower them in the management and self-management of their security. UDEFEGUA can provide observer thereby reducing the risk of human rights abuse.

In Peru, there is no equivalent to UDEFEGUA and therefore a different approach was adopted. A REDD+ project operating in a protected area through a collaboration between the project proponent and the protected area authority. The project area is subject to high levels of illegal artisanal gold mining, an activity that the Peruvian army was brought in to address. The army came to the area periodically to remove artisanal mining camps and confiscate machinery used by the miners. These raids brought with them a risk of human rights abuse, and whilst the REDD+ project staff were not involved in the raids directly, the project did support the army logistically. Project staff were trained to observe activities if possible and made aware of how and where to report any human rights concerns.

THE SOCIAL PERSPECTIVE

- Projects, especially selective harvesting in natural forest and forest carbon, may take place in land where other authorities, e.g. park authorities, national forest guards, Indigenous communities, have rights and responsibilities related to security. Projects may have limited influence on how these entities operate, but could face reputational and potential legal exposure if human rights are violated by actions taken to protect projects.

Forest sector certification standards do not address project risks to community security. Best practices related to risks to communities from project security are generic not sector specific and include:

- thorough risk assessment covering all aspects of the project, and regularly reviewed and updated;
- a security management plan (and related budget and resources) proportional to the risks;
- training and standard operating procedures (SOPs) that incorporate human rights elements, including clarity about if, when and how force may be used, and how any use of force will be reported[46];
- due diligence on any security contractors;
- community engagement to ensure community concerns are recognized and projects are informed of, and deal with, any abuse of power;
- engagement with government or other security actors relevant to the project with the aim of aligning policies and approaches.

14.5 Land aspects

14.5.1 Introduction

The social risks and impacts related to land use in forest sector projects are similar to those in other projects with a large footprint.

- Projects risk displacing existing owners or users, for example, where in some cases, government agencies expropriate land from communities to make it available for new investments.
- Ownership and use rights may be overlapping, poorly documented and a mix of formal and informal systems.
- Local land laws may offer few protections to people displaced from homes or land used for their livelihood by projects,[47] and projects may face grievances and disputes relating to land.[48]
- Where projects enter remote areas without a functioning land market, they are exposed to risks of corruption if well-connected individuals with prior knowledge acquire the sites in anticipation, and to grievances or cost escalation if communities initially agree to sell or lease land for low prices in ignorance of its value to others.

In forest sector projects, because of their scale, these risks and impacts may be exacerbated, as follows.

- Projects are usually developed over time, e.g. expanding the planted area of plantations; progressive restoration of degraded forest, harvesting in natural forest that moves year by year into different areas of the forest, the need to manage land related issues may continue beyond the start-up phase of a project.

[46] See also UN Code of Conduct for Law Enforcement Officials [160] and UN Basic Principles on the Use of Force and Firearms by Law Enforcement Officials [161]
[47] IFC PS5 identifies both 'physical' and 'economic' displacement. Both must be identified and compensated for, PS5 details specific requirements for each.
[48] Systematic information on land disputes relating to forest sector projects in not available. However example, a study of 39 large-scale agricultural investments by the United Nations Conference on Trade and Development (UNCTAD) and the World Bank found, land disputes are the key negative outcome of large-scale agricultural investments. (United Nations Conference on Trade and Development, & World Bank. (2014). The Practice of Responsible Investment Principles In Larger-scale Agricultural Investments: Implications For Corporate Performance And Impact On Local Communities.)

THE SOCIAL PERSPECTIVE

- Land is often leased not purchased, access to, price and other conditions for use, may need to be regularly renegotiated.
- Many countries lack a clear and secure land tenure system or face post-conflict land ownership issues where there can be several owners with land ownership documentation or on-going processes of post-conflict land restitution, e.g. Colombia. An approach used by some forest sector companies is to exclude consideration of any land parcels that cannot demonstrate continuous ownership by the same family back to pre-conflict times.
- Government land administration offices may lack capacity and resources to properly manage the legal aspects of land transactions and dispute resolution. For projects, this can result in lengthy and costly land registration processes, delays in land titling and legal disputes. Land administration institutions may be susceptible to bribery, resulting in corruption and secretive land allocation decisions and pressure on projects to pay bribes.
- In many countries, rural people, in particular, face limited access to judicial mechanisms to resolve land disputes that are often very complex. This makes it especially important that projects and investors implement fair and robust grievance mechanisms.

14.5.2 Standards and practice

Understanding and managing the social aspects of land acquisition and use can present multiple challenges to projects. IFC PS5 establishes best practices for land acquisition. PS5 and related guidance detail what is needed to comply with, and demonstrate compliance with, these principles. The core principles of IFC PS are as follows.

- Involuntary resettlement should be avoided.
- Where involuntary resettlement is unavoidable, all people affected by it should be compensated fully and fairly for lost assets.
- Involuntary resettlement should be conceived as an opportunity for improving the livelihoods of the affected people and undertaken accordingly.
- All people affected by involuntary resettlement should be consulted and involved in resettlement planning to ensure that the mitigation of adverse effects as well as the benefits of resettlement are appropriate and sustainable.

Forest sector certifications include principles relating to land and have a varied level of detailed guidance on how to demonstrate compliance. IFC PS guidance is generally more comprehensive so compliance with PS5 will meet certification standards, but not necessarily vice versa. Specific points where certification standards are more stringent are:

- to achieve the Gold Standard for carbon credits a project cannot include any involuntary resettlement [96] and projects must provide a land use history [97];
- to achieve CCB certification a project must demonstrate that the free, prior and informed consent has been obtained of

THE SOCIAL PERSPECTIVE

those whose property rights are affected by the project through a transparent, agreed process [136].

Investors and project developers should review in detail the requirements of the standards relevant to a project and how these are addressed in project design and implementation. Several sources of guidance are available.

- IFC PS5 Guidance Note
- Interlaken Group: Respecting Land and Forest Rights: A Guide for Companies[49] – guidance on major issues and links to resources
- USAID, Operational Guidelines for Responsible Land-based Investment – detailed guidance on due diligence.
- IFC Good Practice Handbook: Land Acquisition and Involuntary Resettlement [147]

Box B22: VGGT guidelines relevant to business

- Responsible investments should do no harm, safeguard against dispossession of legitimate tenure right holders and environmental damage and should respect human rights.
- Business enterprises should act with due diligence to avoid infringing on the human rights and legitimate tenure rights of others.
- They should include appropriate risk management systems to prevent and address adverse impacts on human rights and legitimate tenure rights.
- Business enterprises should provide for and cooperate in non-judicial mechanisms to provide remedy, including effective operational-level grievance mechanisms, where appropriate, where they have caused or contributed to adverse impacts on human rights and legitimate tenure rights.
- Business enterprises should identify and assess any actual or potential impacts on human rights and legitimate tenure rights in which they may be involved.

It is also useful to be aware that FAO has developed Voluntary Guidelines on the Responsible Governance of Tenure of land, fisheries and forests (VGGT) in the context of national food security. Most of the guidelines relate to actions that states should take. In relation to business, the guidelines focus on respecting the human and tenure rights of others, with an emphasis on recognising and respecting rights of vulnerable and marginalized people.

[49] The Interlaken Group is a multi-stakeholder forum composed of representatives from companies, investors, international organizations, and civil society groups.

THE SOCIAL PERSPECTIVE

The complexity of land issues means that projects should be alert to possible challenges to, and delays in, project implementation. For example, in the 2000s a government of southern Africa, keen to encourage the establishment of forestry, made large areas of land available with attractive leasing costs (approx. USD2 per hectare), however once all the social requirements associated with the land lease were implemented, the actual cost per hectare was closer to USD100.

Box B23: Who represents the community in land leasing negotiations?

A plantation project developer was negotiating a land lease with communities regarding some of their land. During the process, it became apparent that many community members were not happy. Many of the women and youth felt that decisions about their future were being made without their consent. The elder men and opinion leaders, with whom the project developer was negotiating, were signing 60+ year land leases without involving the rest of the community. This led to strikes and, in a few cases, forced work to be halted.

The company reviewed their processes, and, alongside a para-legal NGO, they designed a consultation process that ensured that a revised, inclusive process was followed as part of all land acquisition. This included a participatory mapping approach with all communities, and was designed to ensure inclusion of women, youth and a cross-section of community members. The process encouraged communities to identify sites of importance to them, including areas of cultural significance, areas of food production, education, recreational and NTFP sites.

For many projects participatory mapping exercises can be useful at various stages of the project (e.g. HCV analysis, NTFP studies) and should be included as part of the land acquisition phase. Guidance is available on best practice in participatory mapping [148] [149].

Box B24: Resolving a complex land dispute: CAO [150]

CAO is the dispute resolution mechanism for IFC and MIGA. People who consider they have been negatively affected by projects supported by IFC or MIGA can raise a complaint with CAO. CAO aims to resolve complaints through mediation processes where possible. In 2011, CAO received a complaint concerning an IFC-supported private equity fund, and an investment the fund had made into a plantation company in Uganda. Representatives of 5 communities alleged that they had been displaced from the project area. After a two-year mediation process, an agreement was reached, and the parties committed to a joint program of sustainable development.

What the complaint and the CAO investigation revealed was a complex history of land ownership, land use and legal frameworks. Over many years, people had, in fact, been able to live inside a forest reserve that was meant to be kept clear of settlement and people. Some time after the government granted a concession to a plantation company to plant trees and operate a commercial forestry enterprise, the government compelled people to leave the area. Those displaced faced serious challenges as a result, lacking land to live on and cultivate.

The outcomes included support from the forestry company to the community through a specially constituted co-operative; a recognition by the community of the company's legal right to operate, and a joint development forum. CAO monitored the process for four years following the agreement. CAO report, however, that despite the the co-operative buying four parcels of land for its members to live on and work, "due to the vast complexities of land tenure and transfer in Uganda, only one of these has been successfully settled to date (2018)."

The outcome regarding acquisition of replacement land for displaced people highlights a complexity that can be found in other locations too – that it is not always possible to provide replacement land for people who are displaced, even when there is commitment to do so.

THE SOCIAL PERSPECTIVE

14.6 Gender, Safeguarding and Gender Based Violence and Harassment (GBVH) in the forest sector

The forest sector presents safeguarding and GBVH[50] risks related to male dominated workforces; remote sites; accommodation camps; transport routes through remote communities; and cultural norms about female roles. Also where projects are developed on land that was previously under community use, women may be disproportionately impacted due to responsibilities for domestic food production or activities that depend on access to forest resources. Sometimes safeguarding and GBV risks are identified in complaints and grievances. Good practice guidance for the private sector on Addressing Gender-Based Violence and Harassment [151] was released in 2020 by BII (then CDC), IFC and the European Bank. The guidance includes practical tools for identifying, preventing, responding to, and monitoring GBVH with a focus on a survivor centered and non-discriminatory approach.

Box B25: Addressing gender-based violence in a REDD+ project

In the course of due diligence for a REDD+ project in Latin America that was being developed with Indigenous communities as partners, local women described their exposure to sexual violence and exclusion from decision-making within the community. They also explained their goal of having women only spaces and being involved in community decision-making. As part of the Environmental and Social Action Plan (ESAP) setting conditions for the project, investors required the project to deploy some female community relations officers and work with local female leaders to ensure a FPIC process that explicitly included women in a culturally appropriate way. Technical assistance was also offered to work with women and men in the community to enhance opportunities for women with the aim of also reducing gender-based violence.

14.7 Indigenous Peoples

14.7.1 Introduction

With 36% of the world's remaining intact forest landscapes on Indigenous Peoples' lands, Indigenous Peoples[51] are particularly important in many forest-based projects [152]. Forestry projects can pose risks to Indigenous People through impacts on land or resources that they own or use, formally or informally, and where projects do not engage with the communities in an effective and culturally appropriate way. Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded. This is relevant for large-scale wood production, logging in natural forests and for carbon projects.

14.7.2 Standards

Indigenous Peoples' rights have been legislated in some countries like the Philippines and Colombia. As with other issues such as labor standards, it is important that projects identify what national laws and processes apply and how the definitions and processes in national law compare to project or investor requirements. IFC PS7 sets out detailed objectives and procedures where projects might impact on Indigenous Peoples. Forestry certifications all require identification and consultation with Indigenous Peoples.

The key approach that has been developed by national lawmakers, international organizations and in certification standards to avoid projects having negative impacts on Indigenous Peoples is a requirement for Free Prior and Informed Consent (FPIC) where a

[50] GBVH is an umbrella term that includes a range of behaviors, including: sexual exploitation, abuse and harassment; violence and harassment that is physical and/or psychological; and financial abuse.

[51] There are several key terms that are commonly used to describe Indigenous Peoples, their rights, identities, and issues. IFC Performance Standard 7 notes that Indigenous Peoples may be referred to in different countries by different terms, these include "indigenous ethnic minorities", "minority nationalities", "scheduled tribes", or "tribal groups" [12].

THE SOCIAL PERSPECTIVE

project has any of the following potentially adverse impacts.[52]

- Impacts on lands and natural resources subject to traditional ownership or under customary use;
- Relocation of Indigenous Peoples from lands and natural resources subject to traditional ownership or under customary use;
- Significant impacts on critical cultural heritage that is essential to the identity and/or cultural, ceremonial, or spiritual aspects of Indigenous Peoples lives, including natural areas with cultural and/or spiritual value such as sacred groves, sacred bodies of water and waterways, sacred trees, and sacred rocks;
- Use of cultural heritage, including knowledge, innovations or practices of Indigenous Peoples for commercial purposes.

There are subtle differences between the standards in the definition and processes relating to FPIC and Indigenous Peoples. If a project complies with PS7, it can be expected to meet the requirements of certification standards with respect to Indigenous Peoples. With the exception of FSC, limited guidance is provided on how to implement FPIC for the different forestry standards and therefore the PS7 approach should be followed. FSC has a comprehensive guide [153] which outlines the process in detail. PEFC has the least rigorous approach, requiring adherence to local, national and international legislation, and using the ILO Convention No.169 – Indigenous and Tribal Peoples Convention, 1989 [154] as their framework.

Gold Standard and CCB provisions also give FPIC rights to impacted non-indigenous communities.

14.7.3 Implementing standards

For projects in any sector, achieving and maintaining free prior and informed consent is complex and usually requires the project accessing context specific expert advice. Several documents and toolkits provide guidance on FPIC, e.g.:

- IFC PS7 Guidance Note [145]
- FAO Toolkit on FPIC [155]
- USAID Guidance on Monitoring FPIC [156]
- SPOTT Thematic Guide to FPIC [157]
- Conservation International, Guidelines for FPIC [158]

Specific to the forestry sector are:

- FSC Guidelines on the Right to Free Prior and Informed Consent [153]
- UN REDD+ Guidelines on FPIC [159]

An FPIC process can be more lengthy and more costly than other stakeholder engagement and may not result in achieving consent, meaning that a project cannot go forwards. NGO's specific to Indigenous groups may have valuable local knowledge and play a role safeguarding the interests of Indigenous Peoples. Failing to identify Indigenous Peoples who might be affected by a project; not engaging effectively and transparently in FPIC processes and not maintaining on-going FPIC through continuing engagement and problem resolution, may risk damaging project success and the reputation of project developers and investors.

The following particular considerations may also apply to forest sector projects.

- Identifying and engaging with Indigenous Peoples in jurisdictions where communities are not formally recognized as indigenous by government though they have the characteristics of Indigenous Peoples as defined in PS7. Note: Indigenous communities are more widely recognized in Latin America and Asia than in Africa.

[52] There is on-going discussion of extending the concept of FPIC to local communities beyond Indigenous Peoples [168]. Gold Standard for forest carbon projects already requires FPIC where the rights, lands, resources, territories, traditional livelihoods of Indigenous Peoples or local farmers may be affected; CCB requires FPIC from any whose property rights are affected. This is not incorporated into IFC PS or fully into FSC or PEFC.

THE SOCIAL PERSPECTIVE

- Understanding potential impacts on mobile (nomadic) Indigenous People. Mobile peoples' range of travel may cross national boundaries; there may be competing rights and interests of settled and mobile peoples. Additional time and expertise are needed to understand what impacts a project might have on mobile peoples and to negotiate FPIC.
- In some forest protection projects, e.g. REDD+, there may be forest-dwelling uncontacted communities within the area of protected forest who, by definition, cannot and should not be engaged with. In these circumstances, as well as ensuring there are no impacts of any kind, direct or indirect, from the project, engagement with organizations that represent Indigenous Peoples in order to fully understand risks, is advisable.
- Land rights may be shared or unclear or contested between Indigenous and local communities and other authorities such as those responsible for national parks. Local tensions and conflicts can be generated if a project follows FPIC processes with Indigenous communities but more limited consultation without requiring consent, from non-indigenous communities [160].
- Some projects have found that communities are willing to consent to forestry or carbon projects on a very large part of community land, giving rise to concerns about long-term impacts to community livelihoods. This may represent ill-advised short-term community thinking due to inexperience with project-induced change. To mitigate this risk, one investor applies a 'no more than 30% of community land' rule of thumb.
- Challenges for investors in forest projects impacting on or carried out in partnership with Indigenous Peoples may include logistical complexities and costs of FPIC and monitoring if communities are dispersed across large and relatively inaccessible areas as well as also ensuring that FPIC processes include all communities and segments of the communities.

Box B26: Mobile Communities

In West Africa, the Fula People (or Fulani) are a pastoral group who traverse West Africa. They are not recognized as Indigenous Peoples by governments within this area although they may be acknowledged as nomadic or mobile communities. In many instances governments actively discourage engagement by projects with these communities, resulting in tensions and conflict between projects and mobile peoples and situations where Government organizations (both forestry and army) have reacted with force and firearms to incursions onto property managed by a forestry project. This then posed risks to forestry investments, both in terms of security and reputation. Interacting with mobile communities is difficult and requires a specific communication plan and often specialist advice. Approaches could include;

- Mapping of typical (and historical) migration routes across the landholding
- Negotiating with government to allow engagement
- Developing a tailored communication plan
- Partnering with local organizations - frequently there will organizations who specialize with Indigenous Peoples or mobile communities within those regions
- Creating seasonal jobs (for mobile communities), or using their skillsets for related jobs
- Developing land use opportunities for mobile communities within the forest areas such as grazing in older forest / grassland areas. This may reduce conflict between local communities and mobile communities.
- Facilitating training (and collaboration) for relevant government organizations
- Developing culturally sensitive grievance mechanisms and communication channels.

THE SOCIAL PERSPECTIVE

Box B27: Indigenous People, National Parks and Conflict

A forest carbon project in Latin America is located on land that has dual designation as a national park and as land belonging to Indigenous Peoples. The land is sparsely occupied with dispersed Indigenous villages and campesino smallholder settlements made up of people displaced by decades of conflict. In the context of recent conflict, investors determined that each phase of the project required FPIC from any community that might be impacted.

Box B28: Indigenous Communities Managing Forestry Projects

In South, Central and North America, and Asia-Pacific there are examples of Indigenous communities managing forestry projects, often in partnership with NGO's who have historical contact and trust with the communities. Frequently, these involve several communities. There are success stories of these types of relationships for carbon projects, ecosystem services verification and sustainable forest management. Benefits to communities can include additional income to communities to support the protection of the land where communities have land rights over the area, but limited resources to protect the land. Project design has included:

- Partnership for carbon projects, certification, ecosystem verification or direct investment
- Partnership between Indigenous communities under group carbon schemes
- Investment to provide additional markets and value add for forest products.

14.8 Cultural Heritage

14.8.1 Introduction

Both tangible and intangible forms of cultural heritage may be impacted by forestry projects. Frequently cultural heritage sites are not legally protected and are often undisclosed (e.g. male and female shrines in West Africa, sacred groves, burial sites) or may belong to uncontacted communities, making identification and documentation of these sites difficult. Local history, community consultation, genealogy and engagement and study of national and local archaeology and local heritage can help identify where there might be cultural heritage sites. As outlined in PS8, in cases where it is expected there could be undisclosed cultural heritage sites the knowledge of local communities is particularly important for identifying cultural heritage that may be tied to the natural environment and not evident to outsiders, and expert advice should be sought.

Note that IFC also recognizes 'critical cultural heritage', which consists of (i) internationally recognized heritage of communities who use, or have used within living memory, the cultural heritage for long-standing cultural purposes; or (ii) legally protected cultural heritage areas, including those proposed by host governments for such designation.

Where forest sector projects are implemented in phases, it is essential to review and check information on cultural heritage sites before each phase commences.

14.8.2 Standards

IFC PS-8 details the process for identifying and protecting cultural heritage sites. It provides guidance on different types of cultural heritage and on the types of assessment and consultation that should be carried out. PS-8 requires that cultural heritage is protected from adverse impacts from projects, irrespective of whether it is legally protected or not, or if it has been previously disturbed. It stresses that most

THE SOCIAL PERSPECTIVE

cultural heritage is best preserved in place, that community access to sites of cultural heritage should be maintained. If there is a risk of unavoidable damage to critical cultural heritage, there must be good faith negotiations with, and a documented process of, informed participation of, the affected communities prior to the impacts occurring. The project must retain external experts to assist in the assessment and protection of critical cultural heritage. Note that forest sector projects are not likely to be in a position of causing unavoidable damage because there is usually flexibility in siting.

FSC standards require certified operations to identify sites of special cultural, ecological, economic, religious or spiritual significance, and for which these local communities hold legal or customary rights; and their management and/or protection shall be agreed through engagement with these local communities. Additionally, FSC Principle 9 requires the identification of critical cultural needs and cultural sites as part of HCV analysis.

Box B29: Secret cultural sites

In West Africa, the location of shrines is often kept secret, even within a community (e.g. where there are male and female shrines). There have been instances where a forestry company has not identified the secret locations, resulting in community unrest if the project impacts these, demonstrated by stopping access to land and encouraging community members not to work.

This was rectified by changing the way information about cultural sites was collected, including focus group meetings with men and women separately, led by staff of the appropriate gender; holding informal conversations about cultural sites, and agreeing not to formally record conversations about, and locations of, shrines.

Good practices in the sector include the following:

- Cultural awareness training for employees, especially those working in land preparation (clearing), to ensure chance finds are identified and people know what to do if they come across artefacts or structures that might constitute tangible cultural heritage.
- Including cultural heritage sites in the annual stakeholder engagement plan, as a topic that is regularly revisited.
- Agreeing with communities how sites will be protected, marked if this is culturally appropriate, and remain accessible to the community. Security guards should be made aware of access rights. In some cases, identification and marking of cultural sites may not be culturally appropriate, the way the sites are managed must be agreed with the community.
- Avoid moving cultural heritage. If unavoidable (which is not likely in forestry sector projects) then the detailed safeguards in PS8 should be followed and decisions including consultation with communities and experts documented in detail.
- Any use of cultural heritage should be done with full informed consultation with and participation (ICP) of the community, and where possible community-lead. This can be done in conjunction with other stakeholders (e.g. NGO's). For Indigenous Peoples a full FPIC process needs to be followed.

THE SOCIAL PERSPECTIVE

14.9 Contextual risks and Human Rights

Contextual risks are factors outside a project's direct control that could potentially change or exacerbate the social or environmental impacts of a project, or make mitigation measures less effective. Best practice is to identify contextual risks identified during screening and due diligence, and regularly reassess during the investment period. They serve as pointers to risks that require additional assessment and management. Key types of contextual risk potentially relevant to forest sector projects include:

- violent conflict or hostility between social groups (open, latent, past) that could be exacerbated by the entry of a large-scale project into an area;
- history of land seizures, illegal land acquisition or on-going post-conflict land restitution processes making it very difficult to be confident about the legal ownership of project land;
- corrupt and/or under-resourced local and national government agencies not performing functions essential to the project, e.g. issuing licences and permits; land registrations;
- lack of baseline environmental or social data against which project impacts can be mapped, with risk of future disputes about project impacts, e.g. on availability of water;
- history of projects in the area, forestry or other, that have had negative impacts resulting in local suspicion or hostility.

These factors can also create human rights risks (see Section 14.10).

14.10 Human Rights Due Diligence

The UN Guiding Principles on Business and Human Rights [162][53] (UNGPs) have established a framework for corporate responsibilities relating to human rights – to protect and respect human rights and, where business enterprises identify that they have caused or contributed to adverse impacts, provide for or cooperate in their remediation through legitimate processes.[54] In order to gauge human rights risks, business enterprises should conduct human rights due diligence to identify and assess any actual or potential adverse human rights impacts with which they may be involved either through their own activities or as a result of their business relationships.[55] Many investors voluntarily adhere to the UNGPs, and legal requirements for human rights due diligence are being introduced in some jurisdictions, e.g. the EU Corporate Sustainability Due Diligence Directive (CS3D) agreed in May 2024. This will apply progressively to large companies based in, or with business in, the European Union, though not yet to financial institutions' downstream activities. i.e. for the forest sector, the Directive will apply to forest sector projects that fall within its geographic scope but not to lenders or investors in projects. This may be reviewed in future [163].

Best practices are to integrate human rights into the ESG investment process, and for investor due diligence and monitoring to include checking for human rights risks, noting that these can arise even if a project operates consistently with local law if that law does not protect peoples' rights.

[53] For an introduction to the topic, see UN Guiding Principles 101 by Shift [183]

[54] Ibid, Para. 22. Responsibilities for remedy are differentiated according to whether a business is directly responsible for violation of human rights, indirectly responsible or connected through business linkage. This is a complex topic. For an example of bank lending to a project found responsible for human rights abuses see BSR's report entitled Seven Questions to Help Determine When a Company Should Remedy Human Rights Harm under the UNGPs [184]

[55] Ibid, Para 17. Guidance on human rights due diligence for the financial sector includes PRI, How to Identify Human Rights Risks [185]

THE SOCIAL PERSPECTIVE

Tropical forest

In relation to forest sector projects, factors that could violate human rights include (but are not limited to):

- failure to fully identify and respect land, cultural, political or other rights of Indigenous Peoples, for example, by not identifying their rights, not consulting appropriately and reaching Free, Prior and Informed Consent to the project, disrespecting cultural heritage etc.;
- deployment of use of child, forced or trafficked workers on a project, for example, a construction labor force provided by a third-party not working under terms and conditions consistent with IFC PS2;
- project use of land that displaces existing users from their land or prevents them from gaining their livelihood from the forest, e.g. banning traditional access to non-timber forest products in forests managed for carbon credits; preventing or making difficult community access to fields or pastures;
- unsafe working practices leading to loss of life;
- use of force by security guards, e.g. other than directly to protect of life.

THE CORPORATE GOVERNANCE PERSPECTIVE

15.1 Introduction

This section outlines key corporate governance considerations specific to private sector projects in the forestry and forest-based carbon sectors. These are additional to the corporate governance considerations that apply to any project.

Interpol report that transnational organized criminal groups act along the entire timber supply chain, exploiting institutional and legislative weaknesses. Corruption, legal loopholes, weak control systems and inefficient border patrols jeopardize the rule of law and good governance. Illegal logging and the international trade in illicitly harvested timber are estimated, as of 2019, to account for 15-30% of all timber traded internationally.

Figure B6: Interpol explain that corruption can happen at every stage of the global timber supply chain. Source: Interpol, Strengthening Law Enforcement Cooperation Against Forestry Crime, 2019

A sawmill in Uganda

THE CORPORATE GOVERNANCE PERSPECTIVE

Box B30: Transfer pricing and tax evasion in Papua New Guinea

In June 2023, the Internal Revenue Commission (IRC) of Papua New Guinea imposed a K140 million (USD40,000) tax assessment against a prominent logging operator (identity withheld) for engaging in illicit tax evasion, specifically through transfer pricing, following a detailed audit by the authorities [161].

The main transfer pricing issue uncovered by the audit is that the taxpayer sold log species to related parties at prices lower than international market prices and thus reported a lower income than if its logs would have been sold at arm's length. This means an under-pricing of log species sold by the taxpayer to related parties with significant pricing differences compared to market prices prior to and during the audit period, therefore not generating the fair amount of revenue and consequently reducing corporate income tax liabilities.

PNG is deeply and negatively affected by forgone tax revenues because of base erosion and profit shifting done by taxpayers. The negative impact affects PNG citizens because the much-needed infrastructure, health and education coverage, security, and other public goods and services will not be available to guarantee economic growth and social welfare.

15.2 Key considerations[56]

Key business integrity issues to be considered in relation to investments in projects in the forestry sector include:

- Risks of corruption related to concessions, land title and permits; enabling, for example, timber extraction in environmentally sensitive areas, excess logging, violation of Indigenous Peoples' rights and/or community rights.
- Risks of illegal logging and timber trafficking, i.e. the illegal exploitation of high-value endangered wood species, such as rosewood and mahogany. This could involve, for example, mixing illegally logged wood with legally harvested timber and associated fraudulent documentation.
- Transfer pricing and tax evasion – see Box B30.

Illegal logging and the international trade in illicitly harvested timber take up a significant portion of all timber traded internationally

[56] See also BII, ESG Toolkit, Forestry and plantations [177]

THE CORPORATE GOVERNANCE PERSPECTIVE

15.3 Managing governance risks

Companies developing forestry sector projects should be aware of corruption risks and have systems in place for managing interactions with government officials as well as clear codes of conduct and related training and implementation. Certification provides some comfort but an EU study on 'Certification and Verification Schemes in the Forest Sector and for Wood-based Products' published in July 2021 [162] found that although most schemes have requirements relating to control of corruption these are often insufficient given the clandestine nature of corruption and limited coverage of the risks of corruption in the supply chain.

Factors for investors in the sector to take account of include:

- the overall risks of corruption in the project country;
- clients' systems for assessing, managing and responding to risks of bribery and corruption;
- transparency about the client's business structure, related and associated enterprises and relationships along the supply chain;
- the client's record of tax payments in the host country;
- any insights from engagement with local stakeholders and forest sector NGOs.

Box B31: New methods for traceability

Barcoding: Timber companies and organizations can use barcodes to label individual pieces of timber, crates, and products. These barcodes contain information about the timber's origin, species, and other relevant details. The barcodes are scanned at different points along the supply chain to ensure that the timber's movement is accurately documented and that it complies with legal and sustainability requirements.

RFID Tagging: RFID tags can be attached to timber products, and RFID readers are placed at key locations in the supply chain. This allows for real-time tracking and automated data capture as timber products move through the various stages of processing, transportation, and distribution.

Barcoding and RFID (radio frequency identification) tagging are tools that can be used to track timber from source to end-use, and is widely used in countries with developed infrastructure and technical and enforcement resources that produce tropical timber from natural forests, such as Brazil.

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PART C

ESG INTEGRATION INTO THE INVESTMENT PROCESS

Part C outlines how ESG considerations can be integrated into a typical investment process focusing on aspects specific to forest sector projects. Reference is made to Part B for a detailed explanation of the ESG concepts referred to in the sections below.

- *Section 16 provides an overview of the investment process and the ESG integration in the business/investment strategy;*
- *Section 17 outlines the different ESG considerations in all investment stages, specifically sourcing and screening, due diligence, IC approval, contracting, monitoring and evaluation, exit, and finally TA.*

A bibliography and several annexes can be found at the back of this guide.

OVERVIEW AND STRATEGY

16.1 Overview of the investment process

The broad stages of an investment process are outlined in figure C1. Potential investments, once sourced, are screened for alignment with investment criteria and to ensure they meet the risk appetite of the investor, including no conflict with an exclusion list (if present). If they pass these checks, potential investments then move into due diligence where a full assessment of ESG risk management, as well as the impact potential, is undertaken. Some organizations may have an initial, 'in principle', decision-making step between screening and due diligence. Due diligence involves two main activities, document review and site visit, and may be undertaken solely by the investor or include external specialist consultants to undertake specific assessments e.g. PS6 compliant critical habitat assessments, biodiversity baselines, hydrology assessments, broad community support assessments, or to understand whether FPIC has been achieved.

As discussed in Part B, Section 10, the characteristics of forest sector projects that give rise to specific ESG considerations are *scale, timescale, diversity, importance of certification and supply chain regulations*. Within the investment process these attributes may play a role in shaping the ESG assessment in the following ways:

- Scale – projects are likely to cover very large areas, resulting in studies with a spatial dimension, such as biodiversity assessments, soil assessments, water assessments, being more complex than for smaller projects, and therefore more costly and take more time.
- Timescale – this is particularly important when assessing a project's projected positive impacts, which frequently will take considerable time (longer than the investment tenure) to materialize, e.g. forest restoration, impacts on biodiversity etc.
- Diversity – the complexity of forest sector projects results in correspondingly complex ESG assessments. Substantial additional ESG assessments may also be required during the investment period, for example when plantation trees are ready for harvest and the final product is different from what was expected during due diligence due to changes in the market.
- Certification – if a project has already achieved certification then the certification reports can support

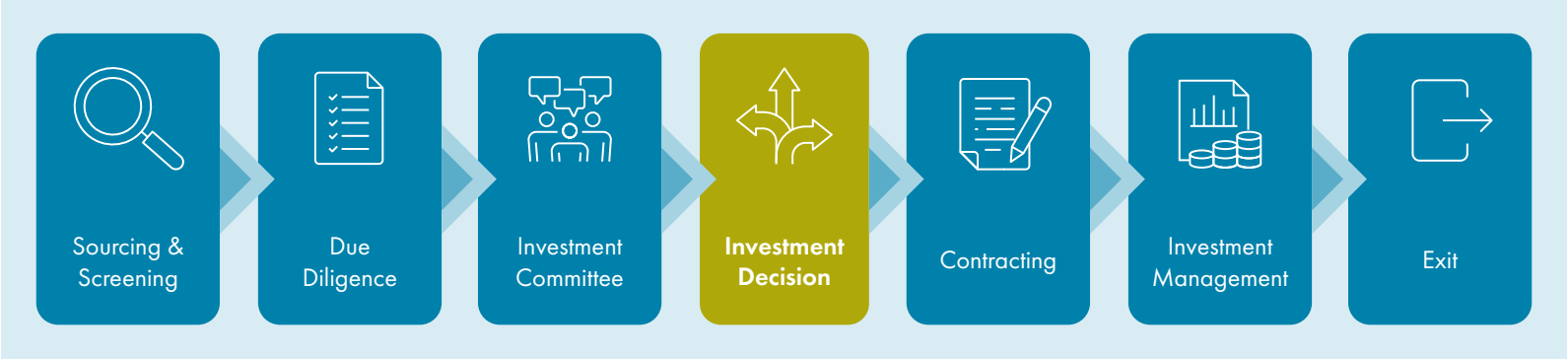


Figure C1: Overview of a typical investment process
This figure shows the steps (blue boxes) from a potential investment being identified through to exit from the investment. The main decision-making point is shown by the green box, however some organizations may have additional decision-making points at earlier stages in the process e.g. between screening and due diligence. These steps may be further sub-divided by investors depending on their processes.

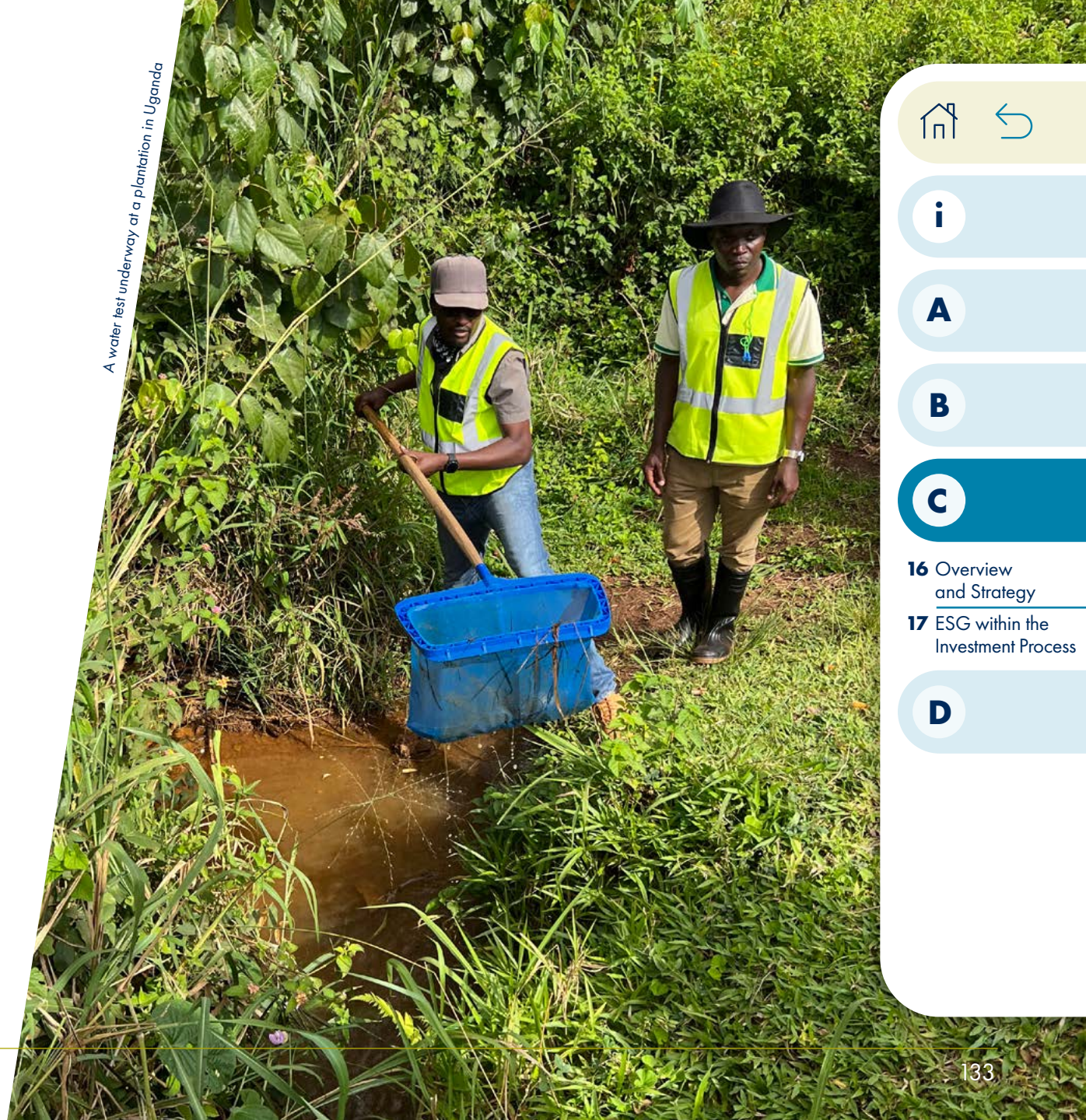
OVERVIEW AND STRATEGY

the ESG assessment process. If not, then understanding and agreeing the timetable to certification will be a key part of most ESG due diligence processes. It is also important to clearly explain the differences between ESG requirements for certification and those of the investor (e.g. IFC PS).

- Supply chain regulation to prevent deforestation – these regulations, where relevant to the project, would be incorporated into legal compliance checks.

Due to the complex nature of forest sector projects and the number of studies required to adequately assess a potential investment, conducting due diligence is a lengthy process. For some project types e.g. establishing new plantations or expanding existing plantations into new areas, or projects involving sustainable natural forest management including practices such as reduced impact logging, due diligence is likely to take the most time since extensive biodiversity and hydrology studies may be needed. It may therefore be beneficial for investors to undertake a feasibility assessment early on in the process to ascertain whether it is possible for the project to meet investor requirements within the time and budget available prior to embarking on a lengthy and costly due diligence.

The result of due diligence (including ESG, financial and commercial) is presented to an investment committee where the investment decision is taken. This may be a decision to invest; a decision to invest subject to specific 'conditions precedent' (CPs) and/or 'conditions subsequent' (CSs) being met; a requirement for additional assessment or rejection. If the decision is made to proceed with investment, the investment contract including ESG clauses and an E&S Action Plan (ESAP) is now agreed, signed and the investment is executed. The investment then moves into



A water test underway at a plantation in Uganda

OVERVIEW AND STRATEGY

management, where regular monitoring and evaluation of the investment progress takes place. Exit occurs ideally at the end of the investment period but may be triggered earlier due to non-compliance with contractual terms (including ESG contractual requirements), financial failure or early settlement of a loan or sale of shares.

16.2 Investment strategy and business development

The development of an investment strategy around the forest sector is a first step for investors considering investment in this area. There is considerable integration between commercial and ESG concerns, with high quality ESG management closely linked to successful commercial performance, therefore it is important to include ESG aspects in the investment strategy. Examples of this integration include the relationship between water and soil management and tree health and growth rates (and therefore timber quality and quantity) in plantations; the engagement of local communities and reduction in, and better management of, fires; and the health of a forest and its resiliency to the impacts of climate change. Managing the forest environment and relations with forest communities is integral to producing wood or carbon credits. Good practice in forest sector investments generally involves achieving certifications such as FSC or PEFC for sustainable forest management projects; or CCB or Gold Standard for forest carbon projects, and as such planning and budgeting for ESG, and consideration of certification options, timelines and requirements should be included in investment planning.

Alongside recognising this close relationship between ESG and commercial aspects, an investment strategy could consider key ESG topics and set out the specific investment criteria and thresholds acceptable to the investment vehicle, e.g. whether FSC (or other SFM) certification is a requirement for their investment; what ESG standards investments will need to meet, e.g. IFC PS; and, what types of project are the investor's priority or excluded from consideration by the investor e.g. some investors exclude projects with potentially high and irreversible environmental and social impacts.[57] As with other projects involving land, such factors might include areas with contested land claims, projects sited in conflict zones, land used by Indigenous Peoples under customary or legal rights, land designated as protected or recognized as having significant biodiversity value (e.g. Key Biodiversity Areas or critical habitat), projects requiring physical and/or significant economic displacement.

Investment strategies may also consider the positive impacts the investor is targeting within the sector and whether there are any thresholds a project needs to meet in order to be eligible for investment. More information on potential positive impacts from forest sector projects can be found in sections 8 and 12.

Commercial and ESG factors are often intertwined in the development of an investment strategy

[57] Often referred to as 'Category A', using the IFC system for categorisation of projects by social and environmental risk. See https://www.ifc.org/content/dam/ifc/doc/mgrt/sp-english-2012.pdf

ESG WITHIN THE INVESTMENT PROCESS

17.1 Sourcing and screening

When a lead comes in the investor needs to gather sufficient information to determine if a project potentially falls within their strategy and risk appetite. From an ESG perspective the key steps are to understand the main characteristics of the project, the activities it includes, and identify key positive impacts and any specific ESG risks within the project that will trigger a more intense level of investigation during due diligence (Box C1). At the end of this process, a plan for due diligence should be clear. Some investors have a decision point after screening to determine whether to move forward to the next stage in the investment process (some investors refer to this as a go/no-go decision). A report of the screening findings covering the ESG issues outlined in Box C1 are, in most cases, essential to support the decision-making process.

Box C1: Typical ESG issues to consider during screening

During the screening process the following issues are generally considered:

- Compliance with the investment strategy – does the potential investment align with the investor's strategy, both in terms of ESG risks and positive impact targets?
- Compliance with the exclusion list – does the potential investment involve any activities that are excluded through the investor's exclusion list?
- Understanding of the main characteristics of the investment – see Box C2.
- Overview of investment activities – may include an overview of the broader activities undertaken by the organization if the investment represents a small part of the organization's operations.
- Which IFC PS are triggered by the investment e.g. does the investment have a potential impact on Indigenous Peoples' lands or access to resources, thereby triggering IFC PS-7?
- Are there any potential ESG risks that will trigger a more intense level of investigation during due diligence? E.g. potential impacts on critical habitat, presence of Indigenous Peoples near or on the project site, economic or physical resettlement etc. See Table C1.
- Overview of ESMS documentation – at this stage it is not a full assessment, rather taking an overview of the policies and processes that exist to indicate the level of understanding regarding ESG management within the team.
- What baseline studies have been completed – gathering any baseline studies already undertaken regarding the potential investment, e.g. HCV, biodiversity baselines, habitat mapping etc.
- What additional baseline studies are expected to be required, including the cost and duration of such studies.
- Regulatory compliance – what regulations are applicable to the project and are they compliant with them?
- Historic land cover, land use, and land cover and land use changes – what was the natural ecosystem of the project area? What is the current and historic land use of the site? What are the patterns of land cover and land use change in the region?
- Project site(s) – are there any active land rights or similar claims related to the project site? Is the project aware of any important cultural sites within or adjacent to the project site, or land-based traditions in the region?
- Contextual risks – are there any factors in the region that may lead to elevated contextual risks? See Part B, section on contextual risks, for contextual risk pointers.
- Impacts of climate change – what are the current and likely future impacts of climate change in the region? How resilient is the project to these impacts?

ESG WITHIN THE INVESTMENT PROCESS

Box C2: Main activities and characteristics of forest sector investments

A key initial step in the screening process should include identifying the main activities and characteristics of the potential investment including what is already in place and what is planned, e.g.:

- whether the investment is into a fund, a corporate, or a project (or project company or SPV);
- whether it involves a plantation, sustainable forest management of natural forest, conservation and/or restoration of natural forest, PES including carbon credit generation, agroforestry, NTFPs, or a combination of several of the above;
- for a plantation – whether it is a new plantation or improvement/replanting of an existing plantation (sometimes referred to a greenfield versus brownfield investments);
- which of the following activities are within the scope of the project: cultivating/propagating seedlings in a nursery, site clearing and preparation, planting, managing a plantation or natural forest, harvesting, storing timber or other forest products, transportation, processing, selling, forest conservation, regeneration and/or protection.
- the site location, ideally geo-referenced;
- whether it involves development and/or operation of a processing facility;
- whether it will involve land purchase, lease or easement;
- whether there will be use of sub-contractors and/or use of third-party-growers or suppliers of wood;
- which, if any, certifications are held, or will be gained or targeted.

Forestry sector investments can include projects developed by a range of actors, from established companies to nascent ventures, in some cases as spin offs from NGOs, or investments into funds that in turn invest into the forestry sector. Established companies will have track records, both from the business and technical perspectives and in terms of their environmental and social risk management. In these cases there will be policies and procedures to assess and environmental and social teams to engage with. New businesses may have limited or no track record and may have limited business experience. Their experience in managing environment and social risks at the scales seen in the forest sector may be limited and the team may not be fully formed. Pilot projects may exist, but the level of risk and the management required are likely to be significantly different when scaling up.

There may also be opportunities to invest in funds. Some are set up specifically to target investment from the impact investment sector (including DFIs and other concessional investors) and in these cases there generally is a framework built around strong ESG performance and an environmental and social team in place. Others will be less familiar with the requirements of these investors and the focus of the screening will include their approach to ESG, the quality of their ESMS and their environmental and social expertise.

Table C1 outlines some key ESG risk and impact areas to consider for forestry investments during the screening stage.

ESG WITHIN THE INVESTMENT PROCESS

Table C1: Key risk and impact areas

Key risk and impact areas	Screening Questions	Section
ESG expertise and record of the project sponsor	• What baseline studies are available (e.g. those covering biodiversity, local communities, historic and current land use maps and land cover change at local and landscape level)? • Is there an established ESMS and performance record (for the project or other operations)? • What is the forest sector ESG expertise of the team? • Is there a budget for ESG management? • Is there a plan for monitoring ESG performance?	17.2.1
Corporate Governance	• What governance structures are in place? • What forest sector expertise is available on the board? • What is the level of ESG risk and impact awareness and understanding?	15
Local Communities	• What communities are there in or around the project area? • Are there expected to be any impacts from project activities on community land, or land (privately) owned (legally or customary) by community members? • What is the expected level of broad community support (present and feasible in the future)? • What are the (potential) benefits of the project to communities? • Do communities gain alternative income or other forms of livelihood support from the resources (i.e. NTFPs)?	14
Security	• What are the security arrangement for the project? Will armed security be part of the project? • Will security be managed in-house or through external contractors, or the government? • What are the local customs and requirements around private security?	14.4.3

ESG WITHIN THE INVESTMENT PROCESS

Table C1: Key risk and impact areas

Land purchase or lease	• Who are the current (legal and customary) owners and users of the site? Is this formalised through a (legal, adequate and uncontested) cadastral baseline? • What is/was the purchase or lease price, length of lease, terms etc? • How was the purchase or lease amount is divided between parties e.g. government, local chiefs etc? • Are there any land legacy issues, including contested land right claims? • Would legal DD on land right holdings be required?	14.5
Resettlement	• Will the project require any economic or physical resettlement? Or has any economic or physical displacement already taken place as a result of the project e.g. because of land purchase? • Has a Resettlement Action Plan and/or Livelihood Restoration Plan been developed? • What is the history of land right transfers?	14.5
Conversion of, or impacts on, critical habitat	• What is the current land use(s) of the project site? • Have there been any biodiversity or habitat assessments? Or ecological studies covering the project Area of Influence (AoI)? • Has an HCV screening or assessment been done? • Are there any protected areas or areas important for biodiversity (e.g. key biodiversity areas[58], key bird areas, etc) at and/or close to the project site? • What is the natural ecosystem of the project site? • Are there any flora or fauna species listed as threatened by the IUCN red list[59] or species of specific local/international concern at and/or close to the project AoI?	13.3

[58] https://www.keybiodiversityareas.org/
[59] Threatened species include any listed as Vulnerable (VU), Endangered (EN) or Critically Endangered (CR) on the IUCN Red List https://www.iucnredlist.org/

ESG WITHIN THE INVESTMENT PROCESS

Table C1: Key risk and impact areas

Land conversion, deforestation or land use change	• What is the historical and current land use at the project site and the landscape it is situated in? • What are the landscape trends for land use and land cover? • Has there been any deforestation or conversion of the project site? When did it take place? Has a cut-off date been set? • Have there been, or are there planning to be, any changes in land use as a result of project activities? • Has as environmental and social impact assessment been undertaken? • Are there particular geohydrological characteristics or landscape elements that merit detailed study? • What is the applicability of the forest laws / code?	13.3, 13.4
Indigenous Peoples	• What Indigenous communities are there in or around the project area? • Is any of the project area used by Indigenous Peoples? • Are there expected to be any impacts from project activities on Indigenous Peoples' lands, resources or access to resources? • What are the FPIC requirements and status of the project? • What are the benefits of the project to Indigenous communities? • What is the expected level of broad support from Indigenous Peoples/communities (present and feasible in the future)?	14.7
Climate change vulnerability	• Has the project undertaken an assessment of climate change vulnerabilities? • Has the project taken into account the potential impacts of a changing climate during project planning? • Is the project located in an area that is particularly vulnerable to the impacts of climate change e.g. coastal areas? • What are the expected climate change mitigation effects? • What could be the key impacts on the project and is the project sufficiently resilient?	6.5
Carbon Integrity	• Which carbon certification scheme will be followed e.g. VCS/CCB, Gold Standard, ACR, Climate Action Reserve, other? • What are the intended ways to deploy carbon credits (open market, traders, eligible off-takers, retire)? • Will any carbon credits generated meet carbon integrity principles, such as the ICVCM Core Carbon Principles? • How many VCUs are expected to be generated?	7.6.4

ESG WITHIN THE INVESTMENT PROCESS

Table C1: Key risk and impact areas

Contextual risk and human rights	• What are the contextual and human rights risks related to the project? • Are there any conflict and/or human rights violations in the project country/region or forest sector including child labor, forced labor, corruption? • Could the project cause, contribute to or be directly linked to any human rights violations? What is the expected leverage of the project to prevent and mitigate risks and impacts? • Is the project sponsor aware of the contextual and human rights risks in the region and sector? • Do they have sufficient experience or know the region and sector well enough to be able to manage these risks?	14.9, 14.10
Reputation risk	• What is the reputation of the project sponsor and project? • Are there aspects of the project e.g. tree species used or forestry model adopted, that hold potential reputation risks? • What is the feasibility and likelihood of positive impact materialisation, and what are key requirements / safeguards necessary to achieve that?	
Positive impacts	• What are the estimated social benefits e.g. direct and indirect employment? • What are the estimated environmental benefits? • What is the expected volume of carbon emissions reductions and/or volume of carbon sequestered? • How will the project measure and monitor impacts?	8, 13
Legal issues and claims	• Are there any known legal compliance issues, including non-compliances with permit conditions? • Any environmental lien? • Any ongoing court cases / litigation processes? • Any E&S-related claims or resource claims? • What is the expected position of governmental authorities to cooperate?	

ESG WITHIN THE INVESTMENT PROCESS

Through this screening, it can be determined whether the investment fits with the investor's strategy and risk appetite, including their ESG expectations. Information that indicates areas of high ESG risk are highlighted through this process for particular attention during due diligence.

A key output of screening is a due diligence plan which typically includes the requirements for due diligence on areas identified as high ESG risk including the expected costs and timeframe; the composition of the due diligence team including specialist consultants as required; key activities to observe and personnel, communities and organizations to meet as part of a project site visit; and further information/documentation needs. The plan should include realistic estimations of costs and timeframes which can then be used as part of the investors decision about whether to proceed with due diligence. It may also feed a go/no-go decision.

Box C3: Typical ESG issues to consider during due diligence

Key issues for ESG due diligence on a forest sector investment include:

- The availability and quality of baseline ESG-related studies and to what extent they are sufficiently reliable and cover the project's Area of Influence (and where IFC PS-6 is applied, the Ecologically Appropriate Area of Analysis). A biodiversity baseline and socio-economic survey data are typically key to have.
- Quality of ESMS, ESG risk assessments and management strategies. See Section 17.2.1 for more information on ESMS expectations for forest sector investments.
- Whether the impacts of project size and timescale have been adequately addressed through the project's ESMS
- The capacity, competencies and commitment of the project team, the number and type of subcontractors to be used for project activities and the formal agreements held with them.
- Whether the project has sufficiently considered the potential negative or positive impacts it may have within the landscape e.g. on communities downstream of the project, on the movement of wildlife across the landscape, on key biodiversity areas (KBAs) or other ecologically sensitive areas.
- Full documentation assessment (see table C2)
- Consideration of what (additional) baseline studies are needed.
- Consideration of where additional specialist studies might need to be undertaken e.g. independent confirmation of FPIC, hydrology baseline studies.
- Critical assessment of the project's expected positive environmental and social impacts, whether these can be enhanced, and how they will be materialised, measured and monitored.
- Corporate governance, including the expertise of board members, and the formal integration of ESG checks and balances, including the authority of the ESG Manager.
- Stakeholder mapping and analysis, including relations with 3rd parties (such as NGOs and Civil Society Organizations (CSO)).
- Verification of the level of (broad) community support and the relevant community relations.

ESG WITHIN THE INVESTMENT PROCESS

17.2 Due diligence

The purpose of due diligence is to conduct a thorough assessment into the risks and impacts (both positive and negative) expected through the proposed investment and to understand the project sponsor's willingness and capacity to manage ESG (Box C3). The key output is a gap assessment between the ESG management of the project and the investor's requirements, which may include compliance with international best practice standards such as IFC PS. Through the assessment, areas of improvement are identified that will need to be filled either prior to investment (conditions precedent) or through an ESAP to be executed following investment. Due diligence is a balance between building a relationship with the project sponsor in relation to a long-term investment and critical appraisal to ensure the project meets, or can within a reasonable period, meet the standards required by the investor. Through the due diligence process a shared understanding with the project sponsor is developed regarding the approach to ESG management. Policies and processes are analyzed for their quality and suitability to address identified ESG risks, alongside how well the policies and processes are implemented.

The project assessment team should include environmental and social specialists and, where relevant, carbon or forestry specialists. E&S specialists (or consultants commissioned on their behalf) conduct one or more site visits during due diligence. Due to the integrated nature of ESG and commercial considerations for forest sector investments, there are considerable benefits to conducting site visits alongside the broader investment team. ESG involvement in discussions around the business case for example can help to identify where ESG assumptions are made and therefore emphasize the importance of strong ESG management to a successful business. However,

A conservation area within a timber plantation in Mozambique. Ensuring appropriate expertise input into the management plans of conservation areas is key to securing successful outcomes for these activities.

ESG WITHIN THE INVESTMENT PROCESS

where project sponsors are small it may be advisable to stagger visits to ensure there is adequate time for thorough consideration of ESG management. Meetings with local stakeholders, including local communities, research institutes and relevant NGOs, are typically a key part of ESG due diligence visits.

Areas of high ESG risk identified at screening stage should be subject to enhanced assessment during due diligence, and appropriate external specialists brought on where needed. For example, where FPIC from Indigenous Peoples is required, and an Indigenous Peoples Plan needs to be in place, best practice dictates that a specialist with knowledge of the particular group of Indigenous People, ideally who speaks the local language, is contracted to undertake an independent assessment to demonstrate whether FPIC has been achieved, as set out in IFC PS-7. Similarly, if a project involves resettlement, then Resettlement and Livelihood Restoration Plans are needed as set out in IFC PS-5, and enhanced due diligence regarding the quality, feasibility and cost of the Resettlement and Livelihood Restoration and Improvement Plans is advised.

A thorough due diligence assessment of a potential investment involves acquiring all relevant policies, procedures, management plans, studies or other documents from the project that were not provided during the screening phase. Where possible these should be received prior to the site visit so that they can be read in advance. Key documents specific to forest sector projects are described in Box C4. Expected documentation and critical questions to consider for forest sector investments are outlined in Table C2 (not including the standard questions considered during ESG due diligence for any investment). This considers a limited selection of some illustrative key questions; it is not meant to present an exhaustive list of DD questions.

Box C4: Key forest sector-specific documents

- Forest Management Plan. Required by FSC and some national legislation for plantations, extraction from natural forest, and in some cases conservation or protection, for instance when projects are within protected areas or forest reserves. See 7.3.2 Box A10 for an outline of key sections of a Forest Management Plan.
- Biodiversity baseline. This involves habitat mapping to identify areas of critical habitat, natural habitat and modified habitat; habitat condition; any species of conservation concern (e.g. threatened species as per IUCN red list); etc. It may be appropriate to initially undertake a screening assessment in order to identify how best to focus resources when undertaking the full assessment.
- Other baseline assessments, including water availability (or geohydrological models) and soil quality. These are important for plantations to demonstrate no negative impacts, particularly when using non-native species such as eucalyptus. Water availability assessments (and follow up monitoring) are complex and may be costly, requiring specialist expertise and community engagement to design a monitoring approach that is fit-for-purpose. Geohydrological studies or modelling, that focus on ground water availability, may also be required.
- High Conservation Value (HCV) assessment. This is required by FSC through their principles and criteria, and also indirectly for FSC Chain of Custody certification which requires an assessment of no damage to HCV areas. As with biodiversity baselines, a screening assessment may be a useful first step here.
- Project Design Document (PDD) for carbon projects. If aiming for Verified Carbon Standard (VCS) certification only, the PDD will not cover social aspects of a project. If the project is aiming for Climate, Community and Biodiversity Alliance (CCB) certification alongside VCS, or Gold Standard, then the PDD is a more comprehensive document including environmental and social impacts.

ESG WITHIN THE INVESTMENT PROCESS

Table C2: Documents and forest sector-specific questions to consider during a due diligence assessment

Key risk and impact areas	Relevant documents (not all will be relevant to every project)	Forest sector-specific questions in due diligence
Availability and quality of key data	• E&S studies • E&S Impact Assessment(s) • GIS data • Satellite-based land use and land cover layers/maps	• What ecological / biodiversity baseline studies are available? • What data is available on the local socio-economic and demographic context? • What satellite-based data (maps) are available and useful to determine land use and land cover changes? • What is the quality (reliability) of the researchers and the data/reports? • What are gaps with international best practices?
ESG expertise and record of the project sponsor	• ESMS documentation including all relevant E&S policies and processes. • Risk assessments. • CVs of client's ESG team.	• Has the project taken into account size and timescale into its risk assessment? • Does the project's risk assessment consider landscape-level impacts? • Does the ESMS adequately support the project to manage those risks, particularly considering project size and timescale? • Does the ESMS include regular reassessment of risk and an adaptive management approach? • What is the sector-specific ESG experience of the client? • What is the level of ESG capacity and competencies, and is that commensurate to the risk exposure and level of effort to manager ESG risks and impacts?
Corporate governance	• List and expertise of board members • Minutes of recent board meetings • Documentation regarding any other governance structures in place	• Does the board contain forest sector, commercial, environmental and social expertise? • Is the board functioning properly? • Does the composition of the board fit with the company's stage? i.e. different expertise may be needed at development stage compared to scaling up.

ESG WITHIN THE INVESTMENT PROCESS

Table C2: Documents and forest sector-specific questions to consider during a due diligence assessment

Local Communities	• Map showing location of all communities in and around the project area(s) – this should consider the wider landscape • Basic information about the local communities – approx. size, main livelihoods, level of poverty etc. • ESIA • Stakeholder engagement plan • Grievance mechanism • Description of benefits the project will bring to the communities, with expected timeframes and analysis of how this will change under various commercial scenarios.	• During site visit, meetings with representatives from local communities give the opportunity to understand the communities' views regarding the project, including any use of resources currently by the community e.g. hunting or NTFPs on project area. • Has the project identified all local communities potentially affected within the landscape e.g. those downstream from a project planning to establish a new plantation? • Does the stakeholder engagement plan adequately support information sharing between the project and local communities, and in a culturally appropriate manner, and in a way that is understandable for all (literate/illiterate) people within the communities? • Do the benefits seem reasonable given project activities? Are there any opportunities to enhance them?
Security	• Security need and risk assessment • Contract with security contractors • Security policy	• What is the security need/risk? • What is the level of (timber, diesel, other) theft, poaching, illegal logging etc.? • Who is providing the security (public, private)? • Are security staff trained for human rights and other E&S matters? • Are there legacy issues regarding security incidents (e.g. confrontations with communities)? • Has the grievance mechanism been adequately socialized so that all communities in the project area are aware of how to raise concerns, including those regarding security personnel?
Land purchase or lease	• Documentation demonstrating ownership/lease/ concession as appropriate. • Evidence of how purchase/ lease amount is divided between relevant parties. • Claim letters or other litigation documents.	• Are there any requirements as part of the land lease agreement related to community, or other, benefits? • Is there evidence of informed consent to the lease term where land is leased from communities? • Is there evidence that land leased from communities will not have a negative impact on food security? • Are there land-right based conflicts or claims?

ESG WITHIN THE INVESTMENT PROCESS

Table C2: Documents and forest sector-specific questions to consider during a due diligence assessment

Resettlement	• Resettlement Action Plan • Livelihood Restoration Plan	• Do the plans adequately consider the impacts of project size and timescale? • Are the eligibility criteria (for compensation and support to affected people) adequately defined and well implemented. • How do the entitlements relate to the actual impacts at household/individual level?
Conversion of, or impacts on, critical habitat	• Habitat and ecological surveys / maps, and ecological/biodiversity assessments (including identification of critical habitat, natural habitat and modified habitat if aligned with IFC PS-6). • Biodiversity baseline • HCV assessments • ESIA	• Will the project result in the conversion of any natural or critical habitat, or irreversible ecological changes/losses? Has the project built in appropriate ecological parameters and mitigants (e.g. no net loss or net gain in biodiversity when alignment is sought with IFC PS-6)? • How will project activities impact the landscape within which the project sits? E.g. could project water use have an impact on ecosystems or land use downstream (for instance on smallholder land)? What is the relationship between the project site and areas of natural habitat and/or protected areas in the landscape? • How could the surrounding land use impact the project site and how could this affect the sustainable forest management approach (invasive species, pesticides use, buffer zone management etc)? • Do the assessments meet the requirements of IFC PS-6 whenever relevant?
Land conversion, deforestation or land use and land cover change	• Maps showing location of all the project activities. • Evidence of current land use e.g. photographs, satellite imagery. See Section 13.3.1 for guidance on satellite data. • Evidence of deforestation date, if relevant e.g. satellite imagery showing when deforestation took place. • Forest Management Plan	• Does the evidence of current land use support the project description? Are there any discrepancies? • Does the deforestation date demonstrated through evidence from the project comply with relevant deforestation cut off dates? • Where land is claimed to be not used by communities, has the project considered the ecosystem services provided and whether use of those services by communities in the broader landscape could be affected by project activities?

ESG WITHIN THE INVESTMENT PROCESS

Table C2: Documents and forest sector-specific questions to consider during a due diligence assessment

Indigenous Peoples	• Map showing location of any Indigenous communities and the extent of their land. • ESIA / impact assessment focused on Indigenous Peoples • Description of benefits to Indigenous Peoples, with expected timeframes etc. • Minutes of meeting and/or IP engagement records	• As above – all considerations for local communities also apply to Indigenous Peoples. • Do local communities/people self-identify as Indigenous Peoples? Does the government identify them as Indigenous Peoples as well? • What is the relation of Indigenous Peoples to the project (site) and how could the project potentially affect the IPs (negatively, positively)? • Are there specific NGOs/CSOs focusing on and/or representing the Indigenous Peoples and their interests? Are these organizations well engaged?
Cultural heritage	• Cultural heritage policy and procedure • Chance-find procedure	• How will the project identify any sites of cultural significance within the project area? • Are there historic finds or publications about the (possible) cultural heritage in the area? • Is there critical cultural heritage at/near the project area (e.g. as per IFC PS-8 definition of critical cultural heritage)? • Do local communities believe the project site houses cultural heritage (incl. shrines etc.)?
Climate change vulnerability	• Climate change vulnerabil-ity assessment, could be part of an ESIA	• Has the project considered po-tential changes in climate dur-ing site-species matching? • Has the project design considered climate change scenario's, also for e.g. drainage design and fire protection?
Gender	• HR policies including equal opportunities • Gender policy • GBVH (incident) records and grievance registers	• Is the project committed to increasing the number of women in their workforce? • Is the project actively ensuring that employment opportunities, training and promotions are equally accessible to both men and women? • Where there is land conversion to plantation forest, does this have a disproportional impact on women's livelihoods (e.g. replacing female-dominated land use (agriculture) for a male-dominated land use (plantation)?
Carbon Integrity	• Project Design Document (PDD) • Carbon integrity policy	• Does the project's carbon integrity policy adequately address carbon integrity risks?

ESG WITHIN THE INVESTMENT PROCESS

Table C2: Documents and forest sector-specific questions to consider during a due diligence assessment

Contextual and human rights risks	• Contextual risk assessment (could be part of ESIA) • Records of public media and 3rd parties • Records of human rights defenders (and relevant organizations) • Summary of country context concerning products targeted by the investment e.g. jurisdictional carbon, timber products aimed at government projects like poles for electrification	• Are there contextual risks relevant to the project, and how is the project organization responding to these risks? • Have human right defenders (or organizations) been in contact with the project/company? • Has the project/company been in the media for human rights issues? • Does the current country/regional context present any risks for targeted products?
Reputational risks	• Public information on project proponent and other relevant entities • Information on reputation of the location and project activities including proposed species for plantations • Grievance register(s) • Evidence and level of broad community support • Engagement with local, relevant NGOs and CSOs	• Is the project aware of these risks? • How is external communication and reputation management currently integrated in the management system? • Is the project capable of managing these risks? • Are the reputational risks acceptable and manageable for the investor?
Monitoring and positive impacts	• Monitoring plan • Targets for environmental and social positive impacts	• Does the plan meet the investors monitoring needs? • What are the impact metrics / indicators / KPIs are how are these integrated in reporting?

The results of the due diligence assessment inform the investor's risk assessment, taking into account both the gross risk exposure (i.e. risk exposure before management actions are put in place) and net risk exposure (i.e. risk exposure after ESAP items have been implemented and the risks managed). This allows the investor to decide whether the investment fits within their risk appetite. These findings are summarized and integrated in the investment (or finance) proposal, which is presented to the Investment Committee. An integrated presentation for the IC allows the many interlinkages between ESG, commercial and technical/operational matters to be highlighted and considered.

Some investors disclose information publicly on projects they are considering supporting (ex ante and/or ex post disclosure), others when the decision to invest has been made; others do not systematically provide public information on their portfolio. Note that information on the specific investments made by funds that invest in the forestry sector are not generally publicly available, although depending on the investor an investment into such a fund is disclosed.

ESG WITHIN THE INVESTMENT PROCESS

Box C5: Use of biodiversity specialists to understand requirements under IFC PS-6

A project proposed to establish plantation forestry on an area currently being used as cattle pasture and considered to be degraded. Habitat assessments revealed that the natural ecosystem of the site was grassland, and, although degraded in some areas, the site is still classed as natural habitat according to IFC PS-6. Therefore, conversion to plantation would require the project to demonstrate, at a minimum, no net loss of biodiversity in order to remain in compliance with IFC PS. Further assessment was needed to understand whether any of the site was critical habitat, which would require a demonstration of a net gain in biodiversity for IFC PS compliance. Since many investors have limitations on conversion of critical habitat within their exclusion lists, this could also result in the investment becoming ineligible.

17.2.1 Environmental and Social Management System (ESMS)

IFC PS1 contains guidance for establishing an ESMS. Some specific elements of the ESMS to consider during forest sector due diligence include the following.

- Risks relating to land tenure. These are often assessed through two channels with the legal status investigated by the legal team, and any informal or traditional land use investigated by an ESG specialist. Coordination of these efforts may enhance this process, avoid duplication of effort and make the process more efficient. Considerations of the appropriateness of a lease agreement, both from the perspective of the project and the landowner (especially if it is community owned land) should take into account the length of the lease, which for forestry are generally long (often between 50 and 100 years). For example, what are the provisions for updating lease payments, and are these fair?

Box C6: Potential gender-differentiated impacts of establishing new plantations

Since forestry is generally a male dominated workforce, the impacts of converting agricultural land to plantation forest could have a disproportionate impact on women. Whilst men and women typically have different roles within the agricultural sector, there are opportunities for both. A conversion of the land to plantation could provide alternative employment opportunities for men, and limited, if any, opportunities for women. To mitigate this risk, considerations include providing equal access to employment opportunities, training and promotions.

- Risks relating to large sites and remote working. Many forestry projects operate over large areas and involve remote working, both characteristics that bring with them specific risks. These include in emergency response management, transport of labor (often the most significant risk to life within the project), communications, prevention and control of forest fires, conflict with wildlife (mainly species like snakes), security and waste management (particularly hazardous waste).
- Contracts/agreements with local communities (e.g. for land lease, as part of a carbon project or an out-grower scheme). The site visit should include visits to the communities in order to ascertain whether they understand the commitments made and whether their expectations of the project are realistic.
- Occupational health and safety (OHS). Globally, forestry (especially logging) has proportionally the highest number of deaths of any sector, therefore a high standard of OHS management is important. Considerations include understanding how the project approaches OHS risks and risk assessments, the management system, record-keeping and oversight.

ESG WITHIN THE INVESTMENT PROCESS

- Community health and safety management should also be considered since forestry projects can increase community exposure to risks and impacts, e.g. through heavy machinery using roads through communities.
- Security management. Use of security should be well understood, including expected use of armed security and whether security will be provided by a third-party. The IFC Good Practice Handbook on the Use of Security Forces: Assessing and Managing Risks and Impacts provides guidance on best practice management of security.
- Contractor management. Forestry projects may rely heavily on third-party contractors, and it is important that there is adequate management of these contractors in place to ensure OHS management, working conditions, pay etc is maintained for all contract workers in line with expectations for employees. FSC Standards do not cover contract workers.
- Agrochemical use. Provision of a list of all agrochemicals used or intended to be used in the project will allow cross-referencing with resources such as The WHO Recommended Classification of Pesticides by Hazard[60], FSC Lists of Highly Hazardous Pesticides[61] and Pesticides Policy[62] and World Bank EHS Guidelines. Integrated pest management (IPM) is required by FSC and recommended in the IFC PS and EHS Guidelines. More information on agrochemical use in forestry can be found in Section 13.5.
- Conservation management. Management plans for conservation areas or ecosystem restoration, using appropriate expertise, are important to maximize success in these activities. Ecosystem restoration can be complex and involve resource intensive activities. Adequate expertise and planning at an early stage ensures these activities are properly planned and provided for in the budget.
- Baseline assessments when a project involves changing land use or species within a plantation. This is particularly important when a project is establishing a plantation using a non-native species e.g. eucalyptus, where there are concerns about impacts on water and biodiversity. Where proper, fit-for-purpose, baseline assessments are not conducted, it is difficult to address accusations of negative impacts later in the project and to monitor positive or negative impacts over the project lifetime.
- Cultural heritage. In order to protect sites of significant cultural value it is important to have policies and processes in place to cover how to act if such a site is discovered during project operations.
- For investments into forestry or carbon funds, understanding how the fund develops its pipeline, conducts its own project selection, due diligence and contracting processes, how it intends to monitor and manage projects post investment, and its exit considerations will be key to understanding the fund's ESMS.
- Confirming that ESG resources, budget and training are sufficient to ensure E&S management capacity in line with investor expectations.

In many cases there will be on-going studies taking place, either as part of the legal requirements of operating in certain countries, as part of certification requirements or as requested by the investor, for example Environmental and Social Impact Assessments (ESIAs), biodiversity studies or High Conservation Value (HCV) assessments. Considerations for an investor include deploying ESG specialist(s) to look at the Terms of Reference for studies and the experience of the study teams to ensure the outputs will meet the investor's needs.

[60] https://www.who.int/publications/i/item/9789240005662 [61] https://connect.fsc.org/document-centre/documents/resource/315
[62] https://fsc.org/sites/default/files/2019-06/FSC-POL-30-001%20V3-0%20EN%20FSC%20Pesticides%20Policy.pdf

ESG WITHIN THE INVESTMENT PROCESS

New planting, acacia mangium

To operate with the high ESG standards expected by investors' ESG policies, access to considerable expertise may be required. This expertise may not always be needed in-house, projects can identify and build relationships with organizations that do have the expertise, for example local universities. This includes expertise (where relevant) in:

- biodiversity and ecosystem services;
- satellite imagery and monitoring;
- geology and soil;
- (geo)hydrology;
- local Indigenous Peoples;
- local cultural and social networks;
- industrial processing;
- health, safety and security including fire prevention and emergency preparedness;
- local land rights legislation;
- local regulatory requirements, including, where relevant, protected area legislation, forest and protected area plans, definitions of deforestation and secondary forest growth, jurisdictional carbon rights.

Box C7: Local legislation regarding deforestation cut off dates

A plantation project in Brazil acquired land that had previously been deforested and converted from forest to agricultural plots. The plots had been left fallow for a number of years prior to being included in this project. A review of local legislation during due diligence revealed that the regulations in the state where the project was located requires a permit to be granted for clearance of secondary forest with between 5- and 20-years' growth, whereas secondary forest with less than 5 years growth could be cleared without. Secondary forest growth of over 20 years is considered of sufficient biodiversity value that clearance is not allowed. (Similar legislation is in force in other parts of Brazil although it does vary between States.) This resulted in the project undertaking a more complete assessment of the land to assess the age of secondary forest; reducing the area proposed for the plantation, and delays in the schedule.

Note: compliance with local legislation regarding deforestation is not necessarily sufficient to meet certification or investor requirements or other legislation e.g. EUDR. See Section 11.7 for deforestation cut off dates.

17.2.2 Key Challenges

There are some challenges that can come up in the due diligence process.

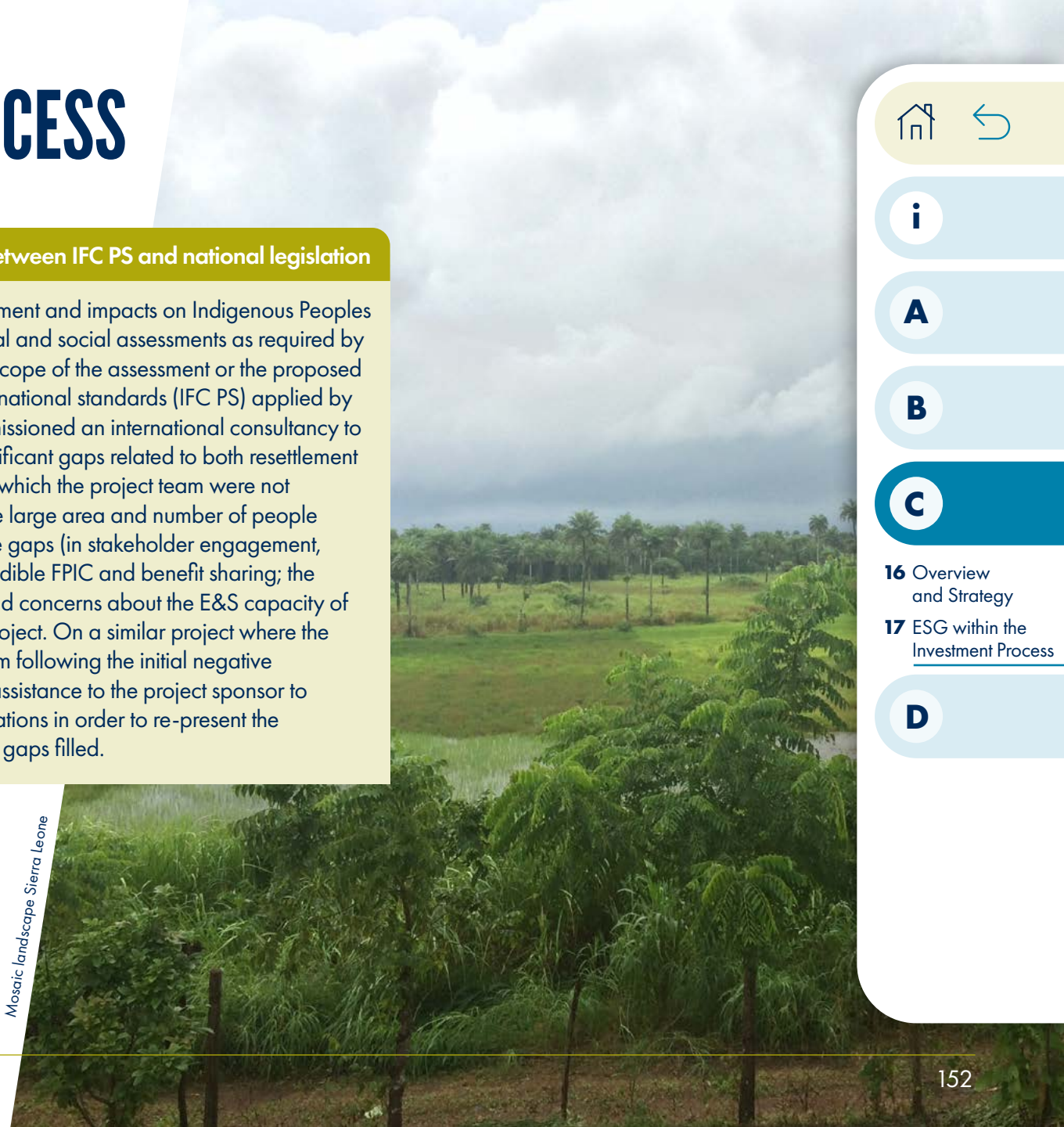
- When E&S assessments are conducted based on local or national law rather than to international standards (e.g. IFC PS) then some requirements may be missed. A gap assessment is needed to ascertain where differences exist between the legal requirements and the investor's ESG policy. Areas where this can present particular issues include resettlement, impacts on Indigenous Peoples and impacts on biodiversity.

ESG WITHIN THE INVESTMENT PROCESS

- It is important to discuss with project sponsors early on in the investment process where an investor's ESG policies (chiefly the IFC Performance Standards in many cases) go beyond the requirements of certifications such as FSC, PEFC and CCB. For some project sponsors, gaining certification is a significant achievement in itself and discussions may be necessary to determine if and how ESG management needs to improve further.
- Identifying which ESG gaps need to be filled prior to investment, e.g. through conditions precedent, and which can be included in an ESAP for completion post-investment can be a challenge. Taking a risk-based approach and considering the project timeline can help to determine which requirements go where. For example, if the first activity following investment will be land acquisition, then having a compliant land acquisition process would be important prior to investment and could therefore be included as a condition precedent in the contract. However, an OHS policy and operating procedure(s) for the processing facility may be an ESAP item if the processing facility has not been built at the point of investment. In this case the timeframe of the ESAP requirement would be "prior to the operation of the processing facility."

Box C8: Understanding the differences between IFC PS and national legislation

A large-scale project with significant resettlement and impacts on Indigenous Peoples was presented to investors with environmental and social assessments as required by national law, but which did not cover in the scope of the assessment or the proposed mitigation and monitoring measures the international standards (IFC PS) applied by the prospective investors. The investors commissioned an international consultancy to undertake a gap assessment. This found significant gaps related to both resettlement and impacts on the Indigenous communities which the project team were not experienced enough to recognize. Given the large area and number of people potentially impacted by the project, filling the gaps (in stakeholder engagement, resettlement planning and execution and credible FPIC and benefit sharing; the associated impacts on cost and schedule, and concerns about the E&S capacity of the project team the investors declined the project. On a similar project where the project sponsor brought in a skilled ESG team following the initial negative assessment, the investor provided technical assistance to the project sponsor to undertake the necessary studies and consultations in order to re-present the opportunity to the investment committee with gaps filled.



Mosaic landscape Sierra Leone

ESG WITHIN THE INVESTMENT PROCESS

17.3 ESG investment proposal and Investment Committee

Every institution has a slightly different format for presenting the results of the due diligence process to the investment committee. Best practice involves including the ESG and impact analysis as an integral part of the information presented to the investment committee, with the ESG-related conditions precedent and ESAP clearly defined as contractual requirements. ESG expertise on the investment committee panel can be beneficial to provide a critique of ESG findings.

Table C3 contains some examples of conditions precedent used for forestry investments. Table C4 shows some *example* ESAP items.

Table C3: Examples of forest sector Conditions Precedent

Contractual conditions precedent	Rationale
Carbon credits project on Indigenous Peoples' land - document showing free, prior and informed consent (FPIC) from the communities – in the form of General Assembly resolutions from each community and a description of how the communities were informed about the project prior to the General Assembly in order to make an informed decision.	Communities own the carbon and evidence is needed of their agreement to the project. Because leaders do not always represent the views of community members, investors want to see evidence that community members have been informed prior to the project being presented for agreement at each community's General Assembly. Investors face reputational risk if at a later date community members claim not to have been consulted about the sale of their assets. Ensuring FPIC is correctly undertaken is vital for demonstrating carbon integrity.
Selective harvesting from natural forest – a FSC FMU certification suitability assessment outlining significant gaps between current operations and the standards required by FSC. The assessment should provide guidance on feasibility, budget and timeframe to fill gaps.	Gaining FSC certification is a condition of investment by the investor and not achieving the certification would be a significant commercial and reputational risk as well as raising concerns about the E&S management capacity of the project sponsor. If there are substantial changes to project activities that need to be implemented prior to gaining certification then this may affect the commercial viability of the investment and therefore should be identified at an early stage.
A forest sector fund – at least one board member with strong ESG credentials and an ESG mandate.	To ensure that from the top down, ESG considerations are understood and included in fund strategies and ESG is integrated into board
Smallholder plantation (or agro-forestry linked to REDD+) – evidence that the project is of interest to smallholders e.g. from a pilot project, initial expressions of interest etc.	Using land for forest projects (carbon or trees) is a long-term commitment with delayed returns, different to much other smallholder cultivation. What looks like a good idea to project developers may not be attractive to farmers in the face of competing and changing demands on their land and labor.

ESG WITHIN THE INVESTMENT PROCESS

Table C4: Examples of forest sector ESAP items

Topic and project type	Action Required	Timeframe	Deliverable
ESIA and EHS Assessments. Medium-sized logging and processing company.	Conduct a combined EHS audit of sawmills and existing industrial area, and an environ-mental impact assess-ment for the mill prior to installation against IFC Performance Standards (PS2,3,4) and EHS guidelines for sawmills and EHS General guide-lines. Identify gaps in management system and environmental health and safety controls and put in place an appropri-ate action to fill those gaps.	Prior to sawmill installation	A document including: • EHS audit of sawmills and industrial area • ESIA of power plant • Action plan to remedy all gaps
Natural reforestation planning. Small company focusing on peat forest restoration for the purposes of carbon credit generation	Develop a reforestation plan to include, but not be limited to: • An assessment by a peatland ecologist verifying the strategy for restoration is sound and a monitoring system to ensure sufficient peatland expertise is sought throughout the life of the project • A list and justification for the species to be included in the reforestation • A budget for the reforestation • A conservation assessment to ensure that the reforestation strategy maximizes the conservation benefits	6 months from contract	• A detailed reforestation plan, including a nursery plan • A budget • A conservation assessment of the reforestation plan
Baselines and monitoring. Project establishing plantation of non-native species	Develop a monitoring plan to include, but not be limited to: • Biodiversity • water availability • soil quality The plan should include baseline measurements for all indicators where not already available and regular monitoring.	Before initiating any activities re-lated to land clearance.	• A monitoring plan • Baseline assessments

ESG WITHIN THE INVESTMENT PROCESS

Table C4: Examples of forest sector ESAP items

Deforestation-free claims. Small company selling NTFPs from plantation trees.	Should the project wish to market any products as deforestation-free, a publicly available (e.g. on the company's website) and transparent statement of the company's deforestation-free policy should be developed that describes the criteria and monitoring methodology, to be agreed by the investor.	Before deforestation-free language is used in marketing	Publicly available deforestation-free statement that includes transparent deforestation-free criteria and monitoring methodology
E&S Management Capacity Company developing REDD+ and ARR projects across several sites to generate carbon credits	Project to appoint a senior E&S Manager with appropriate qualifications and experience to support development & implementation of the ESMS at company and individual site level as well as other items on this ESAP. The Appointee should be familiar with international best practice requirements, including the IFC Performance Standards and, ideally with REDD+ and ARR project development. This appointment could initially be part-time as long as the manager has sufficient time to develop the ESMS and apply it to the first project.	Appointment to be made prior to the start of implementation at any sites.	• Job description • CV of proposed candidate(s) • Letter of Appointment
Benefit sharing and community engagement Company developing a REDD+ project on a government-owned protected area, with communities present in the buffer zone	Develop an agreement with each community that includes expectations of the project, expectations of the community, benefit sharing, use of resources e.g. fishing access in the project area.	6 months from contracting and before any change to com-munity access to resources or sale of carbon credits	• Community agreements • Benefit sharing agreements (Could be a single agreement per community that covers both benefit sharing and community expectations and resource use.)
Carbon integrity policy Company developing either REDD+ or ARR credits	Establish a Carbon Integrity Policy (CIP) covering production and sale of credits consistent with Good International Industry Practices (e.g. alignment with ICVCM and SBTI), and on the sales side alignment with e.g. VCMI's CCoP and IUCN's NNL and NPI Approaches for Biodiversity (2015). The CIP should also include a due diligence procedure including commercially reasonable efforts to ensure that buyer intentions are consistent with this policy.	Prior to contracting with any co-investors or selling any carbon credits	Carbon Integrity Policy

ESG WITHIN THE INVESTMENT PROCESS

17.4 Contracting

ESG considerations for forest sector projects at the contracting stage include the following:

- ESG and impact terms that form a standard part of contracts including compliance with national law; international reference standards; provision of information about incidents; commitment of regular reporting on ESG and impact to investor(s); investor rights to site visits; access to information and recognition that changes to project activities following investment may trigger additional ESG assessments and/or requirements through additions to the ESAP.
- Most investments will also have an ESAP which will form part of the contract and sets out the ESG items required to fill gaps identified between the project's current E&S management and the investor's ESG requirements, with associated deadlines. Where multiple tranches of funding are provided, performance against the ESAP requirements could be considered as a key requirement to unlock the next tranche of capital. A draft ESAP is produced as an output from the due diligence process, it is then negotiated and agreed with the project sponsor before being incorporated into the contract. This ensures the items and deadlines in the ESAP are feasible, the project sponsor understands what is expected and is committed to implement the plan.
- A monitoring plan should be provided during due diligence (or they may be developed in detail during the early stages of project implementation through an ESAP requirement). This plan can outline the indicators to be tracked, the methodology planned for data gathering and analysis (where necessary), and the frequency of undertaking monitoring activities. A monitoring plan may be broader than ESG and impact monitoring and can include business or commercial indicators as well. Information needed for monitoring and baseline studies are interlinked such that aspects being monitored should be included in baseline assessments so that change can be tracked.
- Where certification is required, this should be established in the contract, with a realistic timetable.

Box C9: Use of an ESAP to improve health and safety management.

A company with a large plantation including areas that are difficult to access due to the terrain was required by an investor through an ESAP to put in place an emergency response management system that takes into account the project context. As a result they now have a 4 wheel drive ambulance capable of reaching all the project areas on site, have improved the communications systems and have implemented regular emergency response drills with their staff.

Box C10: E&S Governance

Considerations for best practice E&S governance in forest sector investments include:

- Suitable expertise on the board, including forest sector expertise (including carbon expertise where relevant), environmental expertise, social expertise specific to the region, commercial expertise specific to the sector and region. The structure of the board should change to reflect the stage of the business i.e. development/pioneer phase or execution phase.
- Establishment of an E&S panel, including specialists and representatives from interested investors, which can discuss and make suggestions regarding E&S issues which arise. These panels are generally advisory and have no formal responsibility.

ESG WITHIN THE INVESTMENT PROCESS

Box C11: Forest sector considerations for contractual clauses

In addition to the usual clauses including representations and warranties, information undertakings, positive undertakings, negative undertakings etc, contracts for forest sector investments could include:

- Compliance with applicable deforestation and land conversion requirements at national and international level
- Agreement with investor prior to starting major new phases of the project e.g. substantial new planting, construction of processing plant
- Within positive undertakings:
  - Periodic climate change risk and impact assessments
  - Conservation management framework
  - Qualified buyer criteria (for carbon credits)
  - Carbon integrity policy and carbon credit purchaser principles
  - Management of all invested land in accordance with the principles and techniques of SFM
  - Operate an E&S advisory panel as agreed with the client
  - Achievement and/or maintenance of certifications, including a timeline
- Within negative undertakings:
  - Replacement of senior E&S staff or forest sector specialists
  - Modification of waterways and streams

17.5 Monitoring and evaluation

As with all projects, ESG monitoring, both internal and by investors, is undertaken to check the project is on track. This section focusses on monitoring and evaluation by investors. Evaluation of monitoring data allows the investor to identify ESG performance issues as early as possible so that remedies can be implemented. Comprehensive Monitoring and Evaluation (M&E) plans, which should generally be in place either before contracting or soon after through ESAP or CP implementation, allow investors to monitor risks, assumptions and positive impacts (Box C12). Ensuring adequate budget has been allocated to implementing the monitoring plan is important since some elements relevant to forestry (e.g. geohydrological monitoring) may be costly. The development of appropriate indicators may require specialist knowledge, e.g. for indicators related to geohydrology, ecology, biodiversity, local culture and Indigenous Peoples. Since forest sector projects are typically large-scale, monitoring of potential negative impacts should consider the landscape as well as the project site.

Box C12: Key components of a Monitoring & Evaluation Plan

- For each indicator the following are typically included:
  - Metric,
  - Units of measurement,
  - Monitoring methodology,
  - Frequency of monitoring,
  - Expected results/targets across investment period,
  - Person/team responsible.
- Evaluation process – may include regular assessment by an E&S Panel or Advisory Committee.
- Timetable and process for reporting to investors.
- Budget.

ESG WITHIN THE INVESTMENT PROCESS

Box C13: Project aspects that may be covered by a Monitoring & Evaluation Plan

M&E plans should allow the investor to track assumptions, risks and impacts of projects. Within the forest sector, some aspects that may be included, as relevant to projects activities, include:

- Progress of regeneration and/or conservation activities against targets;
- Species abundance and quality of hectares in terms of biodiversity and ecological conditions across the project site including natural forest, planted and non-planted areas of plantation;
- Maintenance of buffer zones and fire breaks;
- Geohydrological impacts;
- Occupational Health and Safety Incidents, including contract workers;
- Fire incident rate and associated tree loss;
- Community relations including number and type of community grievances and/or claims;
- Worker welfare including number and type of worker grievances and/or claims.

Consistent underperformance against impact Key Performance Indicators (KPIs) can imply that either the targets agreed with the project were unrealistic or that other factors are impeding the generation of benefits. If targets are shown to be unrealistic then it may be advisable to revise the targets to realistic levels.

For forest sector projects, a key development in monitoring is the quality and availability of satellite data for tracking land use change including deforestation. This can be particularly useful for investors to monitor projects independently, and for large-scale projects to monitor across the whole project site, including areas which are difficult to access. This is a fast-developing field and specialist expertise is required to ensure accurate interpretation of the data. Best practice requires ground truthing of satellite data. More information on remote sensing technologies and their application in the forest sector can be found in Section 13.3.1.

Further, investor monitoring of ESG performance usually follows contractually agreed actions and performance metrics, such as progress against the items listed in an E&S action plan (ESAP). Performance is tracked against pre-agreed milestones, such as completion of the ESMS, establishment of a biodiversity management plan, or execution of community engagement activities. Monitoring also involves new issues that may have come-up, like community or worker grievance redress issues, wildfire responses, pest outbreak controls, or new contextual risks such as domestic tensions around elections or changing legislative regimes. The evaluations usually compare activities undertaken on the ground with the (international / sector) standards that are referred to in the legal agreements, and may also rely on certification audits such as FSC audit reports. The adequacy of the team expertise and capacity is important here, and regular capacity and training need assessments (and associated action plans) often come recommended. Another key element is incident tracking, specifically with regard to health and safety of workers and communities. Incident notifications to investors, and root-cause analyzes-based incident investigation reports and follow-up plans, are often monitored and evaluated for their suitability to prevent recurrence and decrease risk levels. Finally, the ongoing leaning and improvement of the ESMS, including updated risk registers and risk response plans, is an important part of a

ESG WITHIN THE INVESTMENT PROCESS

maturing organization with a pro-active risk management regime.

Investors typically produce impact reports which are a summary of the achievements of their portfolios. In order to generate these reports, they require regular data from projects against agreed impact KPIs and using agreed methodologies. Examples of metrics used for impact monitoring in forest sector investments can be found in Annex B1. Since some positive impacts of forest sector projects,e.g. those on biodiversity, can take a long time to materialise, in some cases longer than the tenure of most investments, impact monitoring should track progress as well as outcomes. Where projects involve natural forest restoration for example, it is unlikely that full restoration will be achieved within the investment tenure, however agreeing restoration targets that can be tracked is a way to understand whether restoration activities remain on track.

As with all projects, investors' monitoring processes vary and can include data collection through online portals or spreadsheets, regular meetings and site visits. Agreeing the approach to investor monitoring is an important element of contracting. It may be useful for the investor to provide templates for reporting by projects to support a common understanding of what is required. Where independent audits of impact data are required, data collected and audited through certification may be useful, e.g. carbon emissions reductions or sequestration data.

17.6 Exit

There are several ways in which a funder may exit from an investment:

- the investment is repaid or equity investment sold;
- the project has failed commercially;
- the project has failed to meet the ESG requirements of its investors.

Where the project or fund has repaid the investment or the equity in the company has been sold then there are some steps that can be taken to encourage the maintenance of high ESG standards and prevention of post-exit impact erosion, however this cannot be guaranteed. These include integration of ESG management and positive impact goals into the business plan, mission and/or strategy of the company; assessing potential buyers of equity/shares for an aligned approach to ESG and impact; and consideration of the timing of exit e.g. whether the ESAP has been completed or whether impact goals have been reached. Requiring companies to achieve certification can provide some comfort following exit if the certifications are maintained (although it is recognized that this generally does not cover all investor ESG expectations).

In the case of project failure on commercial grounds, an investigation by an ESG specialist is needed to ensure that project commitments to communities, the labor environment and the labor force are met as far as is possible and that redundancy processes meet IFC PS2 standards. OCHCR has published guidance to investors, on responsible exit in the context of remedy for human rights violations including a useful set of questions to consider.

Eucalyptus plantation

ESG INTEGRATION INTO THE INVESTMENT PROCESS

For forest sector projects, particular social and environmental issues to consider at exit include:

- Outstanding compensation or commitments to communities
- Maintenance of SFM and/or carbon sector certifications
- Continued application of HR standards to contract workers
- Required future conservation or environmental protection actions
- Maintenance of HCV areas
- Commitments to uphold conservation or other set-aside areas in plantations
- Active buffer zone management
- Community projects or use of resources within the forest e.g. NTFPs
- Ongoing environmental and/or social monitoring studies.

It is important that ESG aspects are included in monitoring and planning for projects on a 'watch list' for possible commercial failure. An investigation by an ESG specialist (covering commitments to communities and labor force, and IFC PS2 requirements, as listed above) at an early stage can result in early identification of potential ESG risks and inclusion of mitigation measures in project rescue plans. There can be a reputational risk to an investor if exit results in the project being terminated with ESG commitments unrealized, or if ESG risks materialize or impacts erode post-exit.

17.7 Technical assistance (TA)

Some investors have technical assistance funds that can be deployed pre-or post-investment to support projects to achieve ESG risk mitigation and impact objectives. The resources available to funds and the modalities for delivery vary: some are to support projects achieve IFC PS or other certification compliance (e.g. FSC, PEFC, CCB, VCS), some for actions going beyond; some are grant-based, many require a cash or in-kind contribution from the project. For innovative projects and for projects that are scaling up TA can be particularly valuable. TA can provide the type of expert consultancy support that a larger and more established company might acquire directly from consultants. Where TA will be useful is identified in DD and is project-specific. Examples of TA to support ESG best practices in the forest sector include:

- Support to a fund to develop a manual for, and train staff on, use of remote sensing data to track land use change and so make use of this rapidly improving source of information.
- Support to a project to develop products and markets for NTFPs and crafts as part of the livelihood support for a REDD+ project.
- Fund or project level assessment of options to enhance opportunities for women.
- Pre-investment TA to establish E&S baseline information or to develop job descriptions and recruit for ESG staff.
- Support to a project to develop a plan for active natural restoration of set-aside areas of a plantation in order to maximize biodiversity benefits.
- Support to establish a Sustainable Forest Management regime in alignment with Good International Industry Practices.
- Support to establish a detailed roadmap to progress over time from FSC certification to IFC PS compliance.
- Support to cooperate with local research institutes (e.g. Universities) and NGOs/CSOs for adequate environmental monitoring, e.g. through PhD-positions.
- Support to determine and design projects that add additional value, such as sustainable wood waste solutions (e.g. co-generation) or biochar.

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PART D

ANNEXES AND BIBLIOGRAPHY

ANNEXES

Annex A1: Detailed forest types
Forest Types based on interpretation from the UNEP 2000 Global Forest Type Map [103].

Temperate and Boreal Forest Types	
Forest Type	**Classification**
Evergreen needleleaf forest	Natural forest with > 30% canopy cover, in which the canopy is predominantly (> 75%) needleleaf and evergreen.
Deciduous needleleaf forest	Natural forests with > 30% canopy cover, in which the canopy is predominantly (> 75%) needleleaf and deciduous.
Mixed broadleaf/needleleaf forest	Natural forest with > 30% canopy cover, in which the canopy is composed of a more or less even mixture of needleleaf and broadleaf crowns (between 50:50% and 25:75%).
Broadleaf evergreen forest	Natural forests with > 30% canopy cover, the canopy being > 75% evergreen and broadleaf.
Deciduous broadleaf forest	Natural forests with > 30% canopy cover, in which > 75% of the canopy is deciduous and broadleaves predominate (> 75% of canopy cover).
Freshwater swamp forest	Natural forests with > 30% canopy cover, composed of trees with any mixture of leaf type and seasonality, but in which the pre-dominant environmental characteristic is a waterlogged soil.
Sclerophyllous dry forest	Natural forest with > 30% canopy cover, in which the canopy is mainly composed of sclerophyllous broadleaves and is > 75% evergreen.
Sparse trees and parkland	Natural forests in which the tree canopy cover is between 10-30%, such as in the steppe regions of the world. Trees of any type (e.g. needleleaf, broadleaf, palms).

ANNEXES

Annex A1: Detailed forest types

Tropical Forest Types	
Forest Type	**Classification**
Lowland evergreen broad-leaf rain forest	Natural forests with > 30% canopy cover, below 1200m altitude that display little or no seasonality, the canopy being >75% evergreen broadleaf.
Lower montane forest	Natural forests with > 30% canopy cover, between 1200-1800m altitude, with any seasonality regime and leaf type mixture.
Upper montane forest	Natural forests with > 30% canopy cover, above 1800m altitude, with any seasonality regime and leaf type mixture.
Freshwater swamp forest	Natural forests with > 30% canopy cover, below 1200m altitude, composed of trees with any mixture of leaf type and seasonality, but in which the predominant environmental characteristic is a waterlogged soil.
Semi-evergreen moist broadleaf forest	Natural forests with > 30% canopy cover, below 1200m altitude in which between 50-75% of the canopy is evergreen, > 75% are broadleaves, and the trees display seasonality of flowering and fruiting.
Mixed broadleaf/needleleaf forest	Natural forests with > 30% canopy cover, below 1200m altitude, in which the canopy is composed of a more or less even mixture of needleleaf and broadleaf crowns (between 50:50% and 25:75%).
Needleleaf forest	Natural forest with > 30% canopy cover, below 1200m altitude, in which the canopy is predominantly (> 75%) needleleaf.
Mangroves	Natural forests with > 30% canopy cover, composed of species of mangrove tree, generally along coasts in or near brackish or salt water
Deciduous/semi-deciduous broadleaf forest	Natural forests with > 30% canopy cover, below 1200m altitude in which between 50-100% of the canopy is deciduous and broadleaves predominate (> 75% of canopy cover).

ANNEXES

Annex A1: Detailed forest types

Sclerophyllous dry forest	Natural forests with > 30% canopy cover, below 1200m altitude, in which the canopy is mainly composed of sclerophyllous broadleaves and is > 75% evergreen.
Thorn forest	Natural forests with > 30% canopy cover, below 1200m altitude, in which the canopy is mainly composed of deciduous trees with thorns and succulent phanerophytes with thorns may be fre-quent.
Sparse trees and parkland	Natural forests in which the tree canopy cover is between 10-30%, such as in the savannah regions of the world. Trees of any type (e.g. needleleaf, broadleaf, palms).
Other Forest Types	
Forest Type	**Classification**
Disturbed natural forest	Any forest type above that has in its interior significant areas of disturbance by people, including clearing, felling for wood extraction, anthropogenic fires, road construction, etc.
Exotic species plantation	Intensively managed forests with > 30% canopy cover, which have been planted by people with species not naturally occurring in that country.
Native species plantation	Intensively managed forests with > 30% canopy cover, which have been planted by people with species that occur naturally in that country.
Unspecified forest planta-tion	Forest plantations showing extent only with no further infor-mation about their type, This data currently only refers to the Ukraine.
Unclassified forest data	Forest data showing forest extent only with containing no further information about their type.
Gallery forest	A forest restricted to the banks of a river or stream.

ANNEXES

Annex A2: Principal plantation tree species

Acacia	Grown for wood and tannin from bark, used in furniture and construction, fuelwood and charcoal production, and tanning of leather. Harvest time varies widely, ranging from 7 to 30 years+.
African ma-hogany	Species, such as Khaya ivorensis and Khaya senegalensis, produce high-quality timber that is popular in woodworking. Depending on the growth conditions and intended use, these trees can be harvested in approximately 25 to 40 years.
Cedar	Cedrela species, commonly known as cedar, are valued for their lightweight and easily workable timber. These trees can be harvested in approximately 20 to 30 years.
Eucalyptus	Widely planted for their fast growth and adaptability to vari-ous climates and soil conditions. Uses include pulp, paper, veneer, charcoal, fuelwood and poles., Eucalyptus trees can be harvested for pulpwood fuelwood and poles 6 to 10 years, or for timber in around 15 to 30 years.
Gmelina	Gmelina is a fast-growing species native to parts of Asia-Pacific and also grown in plantations in West Africa and Latin America. Uses include, pulp and paper, fuelwood, charcoal, veneer and timber, as well as pharmaceuticals. Harvesting varies between 10 and 30 years depending on end use.
Paulownia	Paulownia trees are known for their fast growth and light-weight wood, and grown in countries such as China and Japan for timber and veneer production. Can be harvested in as little as 5 to 10 years.
Pine	Various pine species are commonly grown in Africa for timber and paper production. Can be harvested for pulpwood in 10 to 15 years, while timber production might require 15 to 30 years.
Sandalwood	Highly valued for its aromatic heartwood, used in perfumes, incense, and carvings, cultivated in various parts of Asia, including India, Indonesia, and Australia. Harvested after around 15 to 25 years.
Burmese Teak	Highly valued for its quality timber, durability and resistance to decay. Harvested between 18 to 30 years, although trees can continue to grow and improve in quality for much longer periods if managed well.

ANNEXES

Annex A3: Overview of wood processing facilities and processes

Process Phase	Facility	Common processes
Primary Processing	Sawmill – Wetmill	High pressure log washing/ debarking Heavy machinery or conveyor systems or log movement
		Saws of various types to cut the edges off a round log to make a square cant; cut the cant into boards; cut off any wane on the edges of timber board and cut to specified widths; cut to length and trim.
	Sawmill – Drying Kiln	Dries rough sawn timber to specified moisture contents –most commonly with boilers burning wood waste, but may also be gas or electrically powered.
	Sawmill – Drymill	Saw and planes to retrim board to customer specific lengths; plane raw sawn timber into a final product; cut out defects from boards to enable better quality uni-formity in timber boards
	Mobile Sawmills	Mobile sawmills can normally be towed onto a site with a truck or tractor.
	Timber Treatment Plant	Autoclaves (high pressure vessels) are used for the treatment of both sawn timber and poles. Pressure and heat are used to impregnate the wood with preservation chemicals, the most commonly used are Creosote and Chromium Copper Arsenate (CCA).
	Veneer Mill	Log steamer – in some veneer plants there are steaming tanks to steam and soften logs prior to peeling or slicing.
		Lathes to peel or slice wood into veneers.
		Dryers – wet veneers are dried using heated air, this may either be from steam or direct heat.
		Boilers / Heaters – these normally use wood waste to generate heat used in the drying and where applicable the steaming process.

ANNEXES

Annex A3: Overview of wood processing facilities and processes

Primary Processing	Pulp mill	Log yards receive and wash/debark. may have high pressure log washers and / or debarkers
		Chippers are used to chip logs
		Mechanical pulpers are used to extract the wood fibers or cellulose from the chips.
		Depending on the end product, pulp may be cooked, bleached.
		Dryers are used to dry the final product onto rolls.
	Charcoal Kiln	Charcoal kilns may be in many differing designs and formats but two key types exist: Direct firing kilns are where the timber is set alight, then closed off from the air to carbonisation of the wood into charcoal; Retort Kilns use the gases from the burning wood to increase efficiency and the heat used to carbonize the wood is external to wood chamber meaning these is less waste and ash.
	Wood Chip mill	Log yards may have high pressure log washers and / or debarkers.
		Chippers are used to chip up the logs.
		Dryers may be used to dry chips to a desired moisture content or chips may be sold without drying.

ANNEXES

Annex A3: Overview of wood processing facilities and processes

Second Processing	Laminating plants	Glue is applied and boards are pressed together forming a continuous board that is then crosscut to length. (Glue is normally be Polyvinyl acetate [PVA], but for some products may require Urea-formaldehyde based glues).
	Plywood plants	Plywood plants may be independent plants buying in veneers or be a secondary process in larger plant with their own peeling or slicing section.
		Veneer stitching machines, where smaller veneers need to be made into larger sheets, there may be ve-neer stitching machines that stitch together veneers.
		Glue spreading machines spread glue onto one side the veneer that enable the gluing of a number of sheets together to create the desired thickness of the plywood. This is often done as a continuous process with the sheets being cut to size in the process. (see below re-lating to challenges and glues used)
		Presses are used to press the veneer sheets together using pressure and heat. These may be pneumatic or hydraulically operated.
		Sanding machines may be used to sand the surface boards.
	Solid wood plants	Solid Wood plants are similar to laminating plants but may process timber boards into further products.
		Planers and moulders may be used to shape timber into final products.
		Assembly pressers may be used to assembly timber components into final products for example doors.
		Sanding machines may be used to sand down finished products.

ANNEXES

Annex A3: Overview of wood processing facilities and processes

Second Processing	Briquetting plants	These plants would normally either take chips from a chip mill or have this integrated as part of their process.
		Chippers may be used to reduce the size of chips to enable easier processing into smaller briquettes.
		Press machines are used to compress the wood materials using pressure and heat to form a briquette. Some of these machines are continuous feed machines and the briquette is broken off as it exists the machine. Other types of press us moulds to form an individual briquette.
	Chip board plants	These plants normally either take chips from a chip mill or have chipping integrated as part of their process.
		Glue Mixing machines mix glues into the chips
		Presses using heat and pressure press the mixed glue and chips into finished board sizes, or may be continuous feed systems with crosscut saws.
		Some plants have dryers to dry the finished product.
		Sanding machines may be used to sand down finished products.
	Storage and handling	Most of facilities have storage and handling facilities for handling and loading finished products. Moving ma-chinery like overhead cranes and forklifts is common.

ANNEXES

Annex A4: Classification of wood and wood products in international trade and statistics

Wood in the rough (round-wood, logs)	All roundwood felled or otherwise harvested and removed, from natural forest or plantation; hard-wood, softwood, tropical wood etc.
Wood simply worked on or processed	Roughly trimmed wood including wood treated with preservatives, poles and posts.
Wood chips and particles	Wood processing residues used as raw material for the manufacture of pulp, particle board and fibreboard and may always be used as a source of energy.
Wood pellets/ agglomerates	Agglomerates produced from co-products (such as cutter shavings, sawdust or chips) of the me-chanical wood processing industry, furniture-making industry or other wood transformation ac-tivities.
Sawnwood	Wood that has been produced from roundwood, including planks, beams, joists, boards, rafters, scantlings, laths, boxboards and "lumber", etc.
Veneers	Thin sheets of wood of uniform obtained by saw-ing, slicing or peeling (rotary cutting). Veneer sheets are used for the manufacture of plywood, laminated construction material, veneering furni-ture, veneer containers, etc.
Wood-based panels	Aggregates comprising plywood, particle board, oriented strand board (OSB), fiberboard, densi-fied wood, combination board and other panels based on wood or other ligno-cellulosic materials.
Wood pulp	Fibrous material prepared from pulpwood, wood chips, particles or residues by mechanical and/or chemical process for further manufacture into paper, paperboard, fiberboard or other cellulose products.
Secondary wood products	Wood products and furniture; . products resulting from further transformation of sawnwood and oth-er wood-based material. The range of operations and process is very wide, starting with the cutting to size of components and ending with the manu-facture of finished and complex products such as pieces of furniture.

ANNEXES

Annex A5: Key international organizations

Center for International Forestry Research (CIFOR)	A non-profit scientific research organization dedi-cated to advancing human well-being, environ-mental conservation, and equity through improved forest management and policy.
Conservation International	An international, science-based not-for-profit focusing on protection of nature. Natural climate solutions are at the heart of Conservation International's work, including actions that conserve, restore or improve the use or management of ecosystems while maintaining their capacity to absorb and store carbon from the atmosphere. Activities include investment funds providing financing to small businesses with environmental solutions and partnering with commercial players who want to invest in conservation.
European Union	The EU aims to protect and improve the health of existing forests, especially primary forests, while significantly increasing sustainable, biodiverse for-est coverage worldwide, currently through three policies: • EUDR - Regulation on Deforestation Free Products to guarantee that the products EU citi-zens consume do not contribute to deforesta-tion or forest degradation • FLEGT - EU rules to fight global illegal logging and associated trade • Cooperation with partner countries through partnership, forest and multilateral environmental agreements. EUDR requires that any wood imported to the EU a) needs to have been harvested from land not subject to deforestation after 31 December 2020; and b) it needs to be harvested without inducing forest degradation after 31 December 2020.
Food and Agriculture Organization (FAO)	A specialized agency of the United Nations, plays a leading role in promoting sustainable forest man-agement, conservation, and reforestation efforts worldwide. They provide technical assistance, re-search, and policy advice to member countries. The Bi-annual FAO Committee on Forests decides FAO's work programme on forests. FAO is respon-sible for global forest databases and produces technical publications on forest resources.

ANNEXES

Annex A5: Key international organizations

Forest Stewardship Council (FSC)	While not an international organization in the traditional sense, FSC is a non-governmental organization that sets standards for responsible forest management and provides certifications for products sourced from well-managed forests.
GOLD Standard	Gold Standard is a not-for-profit organization headquartered in Geneva, Switzerland, established in 2003 by WWF and other international NGOs to ensure projects that reduced carbon emissions featured the highest levels of environmental integrity and also contributed to sustainable development. Standards under the umbrella include for land use and forestry.
Integrity Council for the Voluntary Carbon Market (ICVCM)	The ICVCM is an independent governance body for the voluntary carbon market. It sets and enforc-es the core carbon principles, drawing on the best science and expertise available, so high-quality carbon credits efficiently mobilise finance towards urgent mitigation and climate resilient development.
International Tropical Timber Organization (ITTO)	A commodity agreement with an environmental dimension, which brings together producers and consumers of tropical timber around the common objective of sustainable forest management. ITTO reports the production and the trade of primary wood products. Historical data can found from 1990. Data is collected through the Joint Forest Sector Questionnaire in partnership with Eurostat, the FAO Forestry Department, and the UNECE Timber Section. The data is also published and analyzed along with coverage of trade flows, species trade, price trends, secondary processed wood products (SPWP) and other trends in the tropical timber sector in the Biennal Review and Assessment of the World Timber Situation.
International Tropical Timber Technical Association (ATIBT)	A trade association representing the private tropical forest sector. ATIBT promotes the sustainable, ethical and legal trade of tropical timber as a natural and renewable resource. It aims to be a leading technical and scientific authority in terms of tropical timber resources, a key partner for industry professionals and their representative when dealing with various stakeholders (governments, international organizations, NGOs, etc.) and a manager of international programs that support tropical forests. Resources include guides to tropical timber species showing uses and CITES status and links to a range of restoration monitoring tools and a timber trade portal with information, e.g forest resources, forest ownership, global forest watch information and key data on producing countries.

ANNEXES

Annex A5: Key international organizations

International Union for Conservation of Nature (IUCN)	A global membership organization composed of both government and civil society organizations, working on conservation issues, including forests. They provide guidance on protected areas, forest restoration, and biodiversity conservation. IUCN resources include the Key Biodiversity Areas (KBA) Tool and related resources which enable investors and corporates avoid nature's most fragile places and The IUCN Global Standard for Nature-based Solutions.
United Nations Environment Programme (UNEP)	UNEP works towards addressing environmental issues, including deforestation, forest degradation, and biodiversity conservation. They facilitate international cooperation and promote sustainable practices to protect forests.
United Nations Forum on Forests (UNFF)	A global intergovernmental policy forum established to promote the management, conservation, and sustainable development of all types of forests. It developed the UN Strategic Plan for Forests 2017-30 and provides a platform for member countries to discuss forest-related issues and foster international cooperation.
VERRA	Verra is a US-based not-for-profit organization. It sets standards for climate action and sustainable development including the VCS standard for reducing deforestation and the linked CCB Standards which provide assurance that a given project is delivering tangible climate, community, and biodiversity benefits. VERRA manages programs to certify that activities achieve measurable high-integrity outcomes and maintains public registries of certified projects.
Voluntary Carbon Markets Integrity Initiative (VCMI)	VCMI collaborates with stakeholders from civil society, the private sector, Indigenous Peoples, local communities, and governments, to realize the full potential of high-integrity voluntary carbon markets. The VCMI Claims Code of Practice is a rulebook on how companies can make voluntary use of carbon credits as part of credible, science-aligned net-zero decarbonisation pathways. It builds trust and confidence in how companies engage with voluntary carbon markets, assisting them in making credible climate claims.
World Bank	The World Bank supports forestry projects and initiatives in many developing countries. They provide financial assistance and technical expertise to promote sustainable forest management and conservation practices. World Bank forest related programmes include Platforms established under the Forest Carbon Partnership Facility; Forest Investment Program (and its associated Dedicated Grant Mechanism for Indigenous Peoples and Local Communities); the Global Wildlife Program (GWP).

ANNEXES

Annex A5: Key international organizations

World Resources Institute	A data driven not-for-profit organization. Key resources include: • Global Forest Watch utilizes cutting edge satellite and remote sensing technology to show near real-time data on tree cover loss. • Forest atlases developed with governments for some countries with large areas of natural forest (Cameroon, DRC, Rep. Congo, Liberia, Gabon,Georgia). • LandMark is a global data platform of Indigenous and community lands to help communities protect their land rights and secure tenure.
World Wildlife Fund (WWF)	An international non-governmental organization working to sustain the natural world for the benefit of people and wildlife. WWF works with governments, companies, communities and other stakeholders to promote certification for responsible forest management practices, combat illegal logging, reform trade policies, protect forested areas, and more.

ANNEXES

Annex A6: Key international/regional initiatives

African Forest Landscape Restoration Initiative (AFR100)	A Pan-African country-led initiative that aims to bring 100 million hectares of degraded land into restoration by 2030. Activities include developing a data and information platform with case studies and guidance on landscape restoration and geo-spatial data on changes in vegetation cover.
Amazon Cooperation Trea-ty Organization (ACTO)	A regional organization focused on the Amazon rainforest's sustainable development and conservation. Its member countries work together to address issues such as deforestation and illegal logging in the Amazon basin.
Asia-Pacific Forestry Com-mission (APFC)	Is a regional forestry commission under the FAO. It facilitates cooperation among countries in the Asia-Pacific region to address forest-related challenges and promote sustainable forest management. APFC focuses on three main areas of work: • Improvement in forest management for multiple benefits • Policy, economics and institutions • Involvement of people in forestry Has produced forest sector outlook documents, latest 2019.
Central African Forest Initia-tive (CAFI)	A partnership between Central African countries and donors to reduce emissions from deforestation and forest degradation and promote sustainable forest management in the Congo Basin. Supports governments develop and implement national forest plans, e.g. The Forest Certification Programme that coordinates efforts to develop national definition of norms and standards for certification and promotes structured dialogue among stakeholders, including public administrations, private sector operators and unions, and certification bodies.

ANNEXES

Annex A6: Key international/regional initiatives

Collaborative Partnership on Forests	A voluntary inter-agency partnership of 16 international organizations, institutions and secretariats with substantial programmes on forests. The vision of the CPF is that "by 2030 all types of forests and forest landscapes are sustainably managed, their multiple values are fully recognized, the potential of forests and their goods and services is fully unlocked, and the Global Forest Goals, the Sustainable Development Goals and other global forest-related goals, targets and commitments are achieved." To support countries achieve these aims, CPF members work together on forest issues to help move from deforestation to restoration.
Convention on Biological Diversity	Seeks to conserve biodiversity, which includes forests and their ecosystems. It promotes the sustainable use of forest resources, the restoration of degraded forests, and the conservation of forest biodiversity. Work on forest biodiversity focusses on: • Conservation, sustainable use and benefit sharing • Institutional and socio-economic enabling environment • Knowledge, assessment and monitoring.
Global Forest Financing Facilitation Network (GFFFN)	The functions of the GFFFN are as follows: • Promote the design of national forest financing strategies to mobilise resources for sustainable forest management (SFM) • Facilitate access to existing and emerging financing mechanisms, including the Global Environment Facility and the Green Climate Fund • Serve as a clearing house on existing, new and emerging financing opportunities and as a tool for sharing lessons learned from successful projects The GFFFN is collaborating with a wide range of organizations, including members of the Collaborative Partnership on Forests (CPF) such as FAO, the GEF, IUCN, UNCCD and UNDP as well as other partners, notably the Green Climate Fund, the African Development Bank, African Forest Forum and Conservation International.

ANNEXES

Annex A6: Key international/regional initiatives

Global Partnership on Forest and Landscape Restoration (GPFLR)	Works to restore the world's lost and degraded forests and landscapes and catalyze dynamic, voluntary action through sharing diverse experiences on restoration efforts that deliver tangible benefits to both local communities and nature through a landscape approach. The Partnership also encourages political commitments on forest and landscape restoration.
Initiative 20x20	Initiative 20x20 is a country-led effort that aims to change the dynamics of land degradation in Latin America and the Caribbean. 18 Latin American and Caribbean countries and three regional programs have committed to improve more than 52 million hectares of land (or about 124 million acres, an area roughly the size of Paraguay and Nicaragua combined) through Initiative 20x20. Supporters include a coalition of impact investors and funds deploying US$3.09 billion in private investment . The initiative is a co-sponsor of the Sustainability Index for Landscape Restoration - a field-tested tool for measuring the impact of restoration efforts and can be used in countries willing to develop monitoring systems at the landscape level.
UN Framework Convention on Climate Change	Key international agreement that sets the agenda for combatting climate change. Includes provisions to combat deforestation and promote afforestation and reforestation as climate change mitigation measures. It encourages countries to implement projects and policies to reduce emissions from deforestation and forest degradation (REDD+),the key instrument for carbon credits related to the forest sector.

ANNEXES

Annex B1: Potential impact metrics

Environmental Impact Metrics

Carbon mitigation, adaptation and resilience

- Tons of CO2e emissions reductions
- Tons of CO2e sequestered
- Reduction in severity of extreme weather events e.g. flooding, drought etc due to forest cover – this is difficult to measure with protection projects, however reforestation projects could look at local impacts of extreme weather events and how they change over time or how they compare with similar areas with no forest.

Biodiversity conservation and habitat restoration

- Changes in species richness – a measure of diversity
- Changes is species abundance
- Changes in presence and/or abundance of indicator species
- Abundance of threatened species i.e. those listed as vulnerable, endangered or critically endangered on IUCN red list
- Changes in Species Threat Abatement and Restoration (STAR) score [180]
- Changes in forest structure over time – restored natural forest should slowly increase in complexity
- Land use change including deforestation rate

Soil protection and health

- Rate of soil erosion within the forest area, usually in metric tons of soil per hectare per year
- Indicators of soil health include organic matter content, pH, nutrient content, etc

Water quality and availability, including watershed management

- Water quality indicators include turbidity, nutrient levels (e.g. nitrogen and phosphorus), presence of contaminants (e.g. pesticides), sedimentation
- Quantity of water available
- Area of watershed protected or restored
- Streamflow changes
- Water temperature

Air quality

- Levels of particulate matter

Access to and availability of non-timber forest products

- Volume of NTFPs available

ANNEXES

Annex B1: Potential impact metrics

Ecosystem connectivity across a landscape & wildlife corridors

- Size of connected ecosystems
- Number and types of species using wildlife corridors

Social Impact Metrics

Income and Employment Generation:

- Number of jobs created or supported.
- Increase in household income due to the project.

Poverty Reduction:

- Percentage of beneficiaries lifted above the poverty line.
- Decrease in the poverty gap index.

Skill Development and Training:

- Number of individuals trained or upskilled.
- Improvement in skills and knowledge level

Asset Accumulation:

- Increase in assets owned by project beneficiaries (e.g. land, livestock, machinery).

Access to Basic Services:

- Improvement in access to healthcare, education, water, sanitation, and housing.
- Distance and time saved in accessing essential services

Health status:

- Illnesses and accidents affecting day-to-day life

Food Security and Nutrition:

- Increase in dietary diversity and nutritional status of beneficiaries.
- Reduction in malnutrition rates.

Sustainable Livelihood Practices:

- Adoption of sustainable agricultural practices or alternative livelihoods.
- Implementation of environmentally friendly techniques.

Market Access and Value Chain Integration:

- Expansion of market access for project beneficiaries.
- Increase in the value of products sold.

ANNEXES

Annex B1: Potential impact metrics

Social Capital and Networking:

- Growth in social networks and collaborations among beneficiaries.
- Participation in community groups or cooperatives.

Empowerment and Gender Equity:

- Level of participation and decision-making power of women and marginalized groups.
- Increase in women's income and control over resources.

Resilience and Vulnerability Reduction:

- Reduction in vulnerability to external shocks (e.g. natural disasters, economic fluctuations).
- Enhanced community resilience.

Quality of Life:

- Improvements in living standards, housing conditions
- Healthier lifestyles and increased life expectancy.
- Perception of well-being/happiness.

Savings and Financial Inclusion:

- Increase in savings and access to financial services.
- Number of beneficiaries with access to credit or microfinance.

Customer Satisfaction and Feedback:

- Feedback from beneficiaries regarding their satisfaction with project outcomes and services provided.

Knowledge Transfer and Behavioural Change:

- Level of adoption of new practices or behaviors promoted by the project.
- Increase in knowledge and awareness among beneficiaries.

ANNEXES

Annex B2: Summary of social risks of different forestry sector activities

Industry/activity	Risks
Land acquisition (including community owned projects)	• Government/authorities may have a role in owning and/or controlling natural forest or the establishment of forests • Indigenous communities' rights, e.g. to live and access resources within protected areas, and the extent to which these rights are respected • Encroachment, e.g. by campesinos, ranchers, traffickers, illegal miners, and related risks, e.g. security, managing squatters consistent with IFC PS, displacement • Lack of information or clarity on laws and regulations governing forest management • Presence of cultural sites • Exclusion of vulnerable groups, minorities or Indigenous People including resource-dependent communities • Business integrity/corruption risks where forestry licences are required from government bodies
Seed production/ harvesting	• Health and safety risks – working at height collecting seeds • Appropriation of local knowledge if seed harvested from wild species
Nursery (commercial and community)	• Securing sites for small-scale nurseries • Market access (competition reducing viability of initiatives) • Possible reduced access to species and quality genetic material for smaller-scale operations • GMOs

ANNEXES

Annex B2: Summary of social risks of different forestry sector activities

Commercial Plantation	• H&S risks related to isolated working • H&S risks related to equipment use • Negative impact on ecosystem services critical for livelihoods • Large plantations can impact connectivity between communities around the plantation, i.e presence or absence of public roads maintaining important community connections
Smallholder/community/ out-grower plantation	• End market variability resulting in socio-economic risks to producers • Possible impact on food security if food-producing land is forested • Long period until forest yields income, e.g. 7+ years for eucalyptus • Can lead to disruption of social/community cohesion/exclusion of vulnerable groups depending on structure etc.
Sustainable management of natural forest	• Increased movement into natural forest with possible risks to cultural/historical/archaeological/religious sites and opening of areas due to logging roads • Health and safety risks of isolated working, tree felling etc. • Human-wildlife conflict • Community-owned Forest: potential for unfair contracts if communities use a third-party agent to develop and implement the forest management plan
Protection of natural forest	• Exclusion of people, esp. Indigenous Peoples, with rights to remain in the natural forest/access forest resources • Cultural sites – exclusion of Indigenous Peoples and/or access by others • Security risks related to restricting previous or ongoing illegal activity • Unfair sharing of carbon revenues • Managing revenue expectations of communities from carbon • Human-wildlife conflict

ANNEXES

Annex B2: Summary of social risks of different forestry sector activities

Natural forest regeneration and restoration	• As for protection of natural forest • Health and safety risks of isolated working within forest areas • Human-wildlife conflict, potential to increase as habitat recovers and species return e.g. snakes, carnivores
Community wood processing	• Quality of jobs/employment conditions • OHS and occupational hygiene-related risks
Commercial wood processing	• OHS and occupational hygiene-related risks, e.g. machine safety, noise

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