

POLICY DEVELOPMENT

26

ITTO criteria and indicators for the sustainable management of African tropical forests



Policy Development Series 26



International Tropical Timber Organization

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ITTO is an intergovernmental organization promoting the conservation, restoration and sustainable management, use and trade of tropical forest resources. Its members represent 80% of the world's tropical forests and 90% of the global trade in tropical timber and timber products. ITTO develops internationally agreed policy documents and guidelines to promote sustainable forest management and forest-based enterprises and assists tropical member countries to adapt such policies and guidelines to local conditions and to implement them in the field through projects. In addition, ITTO collects, analyzes and disseminates data on the production and trade of tropical timber and is the foremost source of information, statistics and trends related to the global tropical timber economy. Since it became operational in 1987, ITTO has funded more than 1200 projects, pre-projects and activities valued at more than USD 430 million. All projects are funded by voluntary contributions, the major donors to date being the governments of Japan and the United States of America.

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Inside cover: Rural women involved in forest landscape restoration and agroforestry in the village of Dimbroko, Côte d'Ivoire. *Photo: MALEBI*

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Foreword

For nearly three decades, ITTO has promoted criteria and indicators (C&I) as tools for implementing sustainable forest management (SFM) in the tropics. For example, ITTO developed the first set of C&I for SFM in 1992 and revised it in 1998 and again in 2016 to incorporate experience gained in tropical forest management and international policy developments.

Forests are vitally important for socioeconomic development in Africa. They provide millions of poor Africans with important nutritional supplements, traditional medicines, household energy and building materials. Forest harvesting and agriculture are the main providers of employment and contribute significantly to the economies of most countries on the continent.

The importance of forests in Africa led the now-defunct African Timber Organization (ATO) to develop a set of principles, criteria and indicators (PCI) for the sustainable management of tropical forests in Africa. ITTO and ATO later worked together to produce a joint set of PCI, publishing the *ATO/ITTO Principles, Criteria and Indicators for the Sustainable Management of African Natural Tropical Forests* in 2003.

The need to revise the ATO/ITTO PCI has become apparent in recent years in light of developments in the international context, particularly:

- increased recognition of the crucial role played by tropical forests in combating climate change;
- the adoption of the Sustainable Development Goals as part of the 2030 Agenda for Sustainable Development; and
- forest landscape restoration initiatives.

ITTO published its *Voluntary Guidelines for the Sustainable Management of Natural Tropical Forests* in 2015. When it organized a workshop in Cotonou, Benin, in 2017 to disseminate these guidelines, participants strongly recommended the revision and adaptation of the 2016 ITTO C&I to ensure their relevance to Africa. Consequently, ITTO engaged two experts, Richard Eba'a Atyi and Olivier Ahimin Adje, to review the ITTO C&I and adapt them to the African context. The result of their work was presented to African experts at a workshop in Douala, Cameroon, on 28–30 September 2021, which reviewed the new set of C&I for Africa.

The set of ITTO C&I for Africa presented in the present document, based on the outcomes of the workshop, have benefited from the considerable experience accrued as a result of implementing the *ATO/ITTO Principles, Criteria and Indicators for the Sustainable Management of African Natural Tropical Forests* under a multiphase ITTO regional project between 2003 and 2016. The present document, published in English and French, also integrates new knowledge related to the climate crisis and the implementation of the Sustainable Development Goals. I am grateful to Dr Eba'a Atyi and Dr Ahimin Adje and all participants in the Douala workshop for their work in developing the C&I for Africa and thereby contributing to ITTO's mandate to promote sustainable management in the world's tropical forests. I also express ITTO's gratitude to the European Union (who funded the workshop and the bulk of the consultancy) and the Government of Japan (who funded the finalization of this Policy Series publication) for their generosity.

Sheam Satkuru

ITTO Executive Director

November 2023

Abbreviations and acronyms

ATO	African Timber Organization (defunct)
C&I	criteria and indicators
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
FLR	forest landscape restoration
FMU	forest management unit
GDP	gross domestic product
ha	hectare(s)
ITTO	International Tropical Timber Organization
IUCN	International Union for Conservation of Nature
kg	kilogram(s)
m	metre(s)
NAMA	national appropriate mitigation action
NGO	non-governmental organization
PCI	principles, criteria and indicators
PFE	permanent forest estate
REDD+	reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries
SDG	Sustainable Development Goal
SFM	sustainable forest management
USD	United States dollar(s)

Executive summary

The *ATO/ITTO Principles, Criteria and Indicators for the Sustainable Management of African Natural Tropical Forests* (ATO/ITTO PCI), published jointly by ITTO and the African Timber Organization (ATO) in 2003, was designed for the member countries of both organizations to use as a guide in their actions to promote and implement the sustainable management of natural forests. ITTO's 2021–2022 Biennial Work Programme included, among other things, the revision of the ATO/ITTO PCI, in line with a recommendation made at an ITTO regional workshop held in 2017.

The present document ("C&I for Africa") has been prepared based on the *ITTO Criteria and Indicators for the Sustainable Management of Tropical Forests* published in 2016. It was developed with the involvement of experts from all ITTO African member countries and informed by the lessons learned in the implementation of a regional ITTO project on the ATO/ITTO PCI, which spanned 2003 to 2016. The C&I for Africa also recognizes the specificities of the African forest sector characterized by a need for improved governance (Criterion 1), the important role of the sector in national economies (Criterion 4), and the socioeconomic importance of forests for communities in Africa (Criterion 7). Given these considerations, the C&I for Africa includes a larger number of indicators than those contained in the global-level ITTO C&I published in 2016.

The development of the C&I for Africa comprised four main stages, with the first three undertaken by consultants recruited by ITTO for this purpose: 1) a review of the level of implementation of C&I for the sustainable management of tropical forests by African ITTO member countries; 2) a review of ITTO's *Environmental and Social Management Guidelines*, *Guidelines for the Forest Landscape Restoration in the Tropics*, and *Voluntary Guidelines for the Sustainable Management of Natural Tropical Forests*; 3) an initial ("zero") draft of a new set of ITTO C&I for the sustainable management of African tropical forests that integrated various aspects covered in the three ITTO guidelines; and 4) a regional technical workshop to validate the zero draft, which brought together 30 participants from ten African ITTO member countries.

Adapting the ITTO C&I to the African context

African forests must be protected and sustainably managed so they can both provide their essential ecosystem services and meet the food, energy and economic needs of communities. Tailoring ITTO's universal set of C&I for the African context involved significant changes, including an increase in the total number of indicators from 58 to 94. Changes in the number of indicators for each criterion is as follows:

- Criterion 1: Enabling conditions for sustainable forest management (17 indicators, compared with 11 in ITTO's universal C&I published in 2016)
- Criterion 2: Extent and condition of forests (10 indicators, compared with 8)
- Criterion 3: Forest ecosystem health and resilience (13 indicators, compared with 5)
- Criterion 4: Forest production (18 indicators, compared with 10)
- Criterion 5: Forest biological diversity (10 indicators, compared with 7)
- Criterion 6: Soil and water protection (7 indicators, compared with 5)
- Criterion 7: Economic, social and cultural aspects (19 indicators, compared with 12).

1 Introduction

ITTO developed *Guidelines for the Sustainable Management of Natural Tropical Forests* in 1990 and followed this with several other sets of thematic guidelines (e.g. on plantations, biodiversity conservation and forest fire). The first version of ITTO's criteria and indicators (C&I) for the sustainable management of natural tropical forests was published in 1992, just before the Rio Earth Summit. This was revised in 1998 and 2016 to incorporate the experience gained in using the C&I and developments in international forest policy processes. ITTO and the African Timber Organization (ATO) jointly published the *ATO/ITTO Principles, Criteria and Indicators for the Sustainable Management of African Natural Tropical Forests* (ATO/ITTO PCI) in 2003. That document, which harmonized two parallel processes, was designed for the member countries of both organizations to use as a guide in their actions to promote and implement the sustainable management of their natural forests.

ITTO's 2021–2022 Biennial Work Programme included, among other things, the revision of the ATO/ITTO PCI, in line with a recommendation made at a regional workshop to disseminate the *ITTO Voluntary Guidelines for the Sustainable Management of Natural Tropical Forests*, which took place in Cotonou, Benin, on 8–12 May 2017. It was in the context of the implementation of that recommendation that ITTO commissioned the present work.

The *ITTO Criteria and Indicators for the Sustainable Management of African Tropical Forests* ("C&I for Africa") was developed with the involvement of experts from all ITTO African member countries, who met at a regional workshop in Douala, Cameroon, in September 2021, informed by the lessons learned in the implementation of a regional ITTO project (PD 124/01 (M)) on the ATO/ITTO PCI, which spanned 2003 to 2016. This document also recognizes the specificities of the African forest sector characterized by a need for improved governance (Criterion 1), the important role of the sector in national economies (Criterion 4), and the socioeconomic importance of forests for communities in Africa (Criterion 7). Given these considerations, the C&I for Africa include a larger number of indicators (94) than the 58 contained in the most recent global-level ITTO C&I (ITTO 2016).

Methodology

The development of the C&I for Africa comprised four main stages, with the first three undertaken by consultants recruited by ITTO for this purpose:

- 1) A review was produced of the level of implementation of C&I for the sustainable management of tropical forests by African ITTO member countries, including an analysis of the functioning of the working groups established during successive phases of the ITTO project (PD 124/01 (M)). A report on the use of PCI by member countries was compiled, which included national reports on progress toward SFM; the training of auditors; and the conduct of pilot audit missions.
- 2) A review of the following three ITTO guidelines was produced: 1) *ITTO Environmental and Social Management Guidelines*; 2) *Guidelines for the Forest Landscape Restoration in the Tropics*; and 3) *Voluntary Guidelines for the Sustainable Management of Natural Tropical Forests*.
- 3) An initial ("zero") draft was developed of a new set of ITTO C&I for the sustainable management of African tropical forests with a view to integrating the various aspects covered in the guidelines referred to above. The preparation of the zero draft also encompassed recent developments on the roles of forests in combating climate change and in achievement of the Sustainable Development Goals (SDGs). ITTO staff contributed comments on the zero draft, which were incorporated into the document.
- 4) A regional technical workshop was convened in Douala, Cameroon, to validate the zero draft. This brought together 30 participants from the following ten African ITTO member countries: Cameroon, the Central African Republic, Côte d'Ivoire, the Congo, the Democratic Republic of the Congo, Gabon, Liberia, Mali, Mozambique and Togo. Three member countries—Benin, Ghana and Madagascar—were unable to participate for logistical reasons.

On the basis of the work carried out in the first two stages, adapting the C&I to the African context consisted of eliminating some indicators from the original version, modifying others and developing new indicators.

Adapting the ITTO C&I to the African context

The importance of forests to national economies explains why the African experts attending the Douala workshop focused a large part of their efforts on Criterion 4 (forest production) and adapted it comprehensively to the African context, substantially increasing the number of indicators.

African forests must be protected and sustainably managed so they can both provide their essential ecosystem services and meet the food, energy and economic needs of communities. In this document, the social importance of forests for African people is highlighted in Criterion 7, for which the experts considered it necessary to increase the number of indicators from 12 to 19.

Promoting SFM and maximizing its role in climate-change mitigation and adaptation often requires changes in policies, strategies and practices—hence the importance of adopting a holistic view of the role of forests when developing tools to promote sustainable forest management. The C&I for Africa recognizes that governance is a major constraint in the management of African forests, which is the reason why the experts provided a particularly detailed explanation of Criterion 1, which now includes 17 indicators, up from 11 in the 2016 ITTO C&I.

Table 1 shows the number of indicators validated for each criterion in the present document compared with the 2016 edition of the ITTO C&I (ITTO 2016), and the main changes made. The number of indicators has increased considerably, reflecting the need for expanded coverage under nearly all criteria to adequately monitor and report on African tropical forests.

Table 1: A comparison of the number of indicators in ITTO (2016) and the present document, and main changes, by criterion and subcriterion

Criterion	Subcriteria	No. indicators, ITTO (2016)	No. indicators, present document	Main changes
1 Enabling conditions for sustainable forest management	Policy, legal and governance framework	3	6	Broaden the scope of indicators to other terrestrial ecosystems and land management and take into account the participation of stakeholders in forest management-related decision-making
	Institutional framework	2	4	Include institutions responsible for sustainable forest management and forest control; take into account the specific functions of personnel responsible for implementing and supporting sustainable management and the need for sufficient related financial resources
	Planning and monitoring framework	4	4	Specify the availability of mechanisms that underlie stakeholder participation in land-use and forest management planning, monitoring and assessment
	Economic framework	2	3	Specify the availability of sustainable funding mechanisms and highlight international funding available for sustainable forest management
Subtotal, Criterion 1		11	17	
2 Extent and condition of forests	N/A	8	10	Provide details on the nature of the extent of forests, particularly in terms of forest area; take into account planted forests, forest ownership types, and the extent and area of production forests with multiyear management plans; include forest certification systems in compliance schemes; take into account the dynamics of forest carbon stock
Subtotal, Criterion 2		8	10	
3 Forest ecosystem health and resilience	Addressing threats to, and vulnerabilities of, forests	3	9	Take into account the extent of deforestation and forest degradation resulting from human activities and existing mechanisms for combating deforestation and degradation at the national and subnational levels; quantify vulnerability in terms of forest area disturbed by natural causes; highlight the availability of a multisectoral consultation framework on climate change, including forests, a strategy to combat climate change at the national and subnational levels, and funding mechanisms as well as mechanisms for monitoring the impacts of climate change on forests
	Restoration of degraded forests and land	2	4	Take into account the availability of strategies and multistakeholder initiatives for the restoration of forest landscapes in line with local needs and of mechanisms for monitoring change in degraded forests
Subtotal, Criterion 3		5	13	
4 Forest production	Resources assessment	4	5	Clarify the nature of assessments, particularly in terms of the extent and area of natural production forests and the effectiveness of wood and non-wood product harvesting in natural forests, based on allowable harvest; document the dynamics of carbon stocks
	Harvesting planning and control procedures	3	9	Extend the scope of indicators to planted production forests and specify concession areas in natural and planted production forests, annual area of planned harvesting in natural and planted production forests, annual area covered by harvesting in natural and planted production forests, and traceability systems compliant with forest certification systems; indicate the availability of a system for monitoring and archiving forest management data
	Silviculture in natural and planted forests	3	4	Clarify that the indicator refers to the uptake and implementation of reduced impact logging principles, and highlight the availability of silvicultural systems implemented in natural production forests; omit the term “strategic” from monitoring of silvicultural systems
Subtotal, Criterion 4		10	18	

Table 1 (continued): A comparison of the number of indicators in ITTO (2016) and the present document, and main changes, by criterion and subcriterion

Criterion	Subcriteria	No. indicators, ITTO (2016)	No. indicators, present document	Main changes
5 Forest biological diversity	Ecosystem diversity	2	3	Specify the extent (number and area) of terrestrial protected areas by type of forest, the availability of operational mechanisms for the management of buffer zones, and connectivity between forest protected areas
	Species diversity	2	4	Provide details on endangered species; provide details on the availability of strategies for the conservation of biodiversity, and of ecological monitoring mechanisms in protected areas
	Genetic diversity	1	1	No change
	Biodiversity conservation in production forests	2	2	Include existing biodiversity conservation measures in planted forests
Subtotal, Criterion 5		7	10	
6 Soil and water protection	Extent of protection	2	3	Include measures for protecting downstream catchment values implemented at the landscape scale and take into account the availability of operational mechanisms for involving land-use stakeholders in soil and water protection
	Protective functions in production forests	3	4	Provide details on the mechanisms implemented to prevent soil and water degradation in production forests; provide details on the mechanisms implemented to prevent soil and water degradation in the non-permanent forest estate (PFE), and take into account the non-PFE area under management for protecting soil and water quality
Subtotal, Criterion 6		5	7	
7 Economic, social and cultural aspects	Economic aspects	3	6	Extend the scope to the national economy, including employment; highlight the economic cost-effectiveness in the industry—timber production volume by product type and quantity of non-wood forest product production; delete “national origin”; identify the importance of wood and non-wood forest product processing by including processing rates
	Social and cultural aspects	6	8	Highlight the availability of procedures for assessing the social and environmental impacts of forest activities and of measures implemented through environmental and social management plans; take into account all stakeholders involved in forest management; provide details on livelihoods in terms of subsistence activities among Indigenous Peoples and local communities in PFE forests
	Local community and Indigenous Peoples' rights and participation in forest management	3	5	Refer to respect for the user rights of Indigenous Peoples and local communities; specify the availability of mechanisms for involving Indigenous Peoples and local communities in forest management and need to assess the extent of their involvement in forest areas under management and wood and non-wood production; indicate the need to take into account the forest management knowledge and know-how of local communities and Indigenous Peoples
Subtotal, Criterion 7		12	19	
Total		58	94	

* ITTO 2016. *Criteria and indicators for the sustainable management of tropical forests*. ITTO Policy Development Series No. 21. International Tropical Timber Organization, Yokohama, Japan.

2 Criteria and indicators for the sustainable management of African tropical forests

Criterion 1: Enabling conditions for sustainable forest management

Policy, legal and governance framework

- 1.1 Policies, laws and regulations governing forests
- 1.2 Policies, laws and regulations governing other terrestrial ecosystems
- 1.3 Policies, laws and regulations governing land management
- 1.4 Forest tenure and forest ownership categories
- 1.5 Forest governance
- 1.6 Existence of stakeholder participation mechanisms for forest management decision-making

Institutional framework

- 1.7 Institutions responsible for SFM
- 1.8 Institutions responsible for forest control
- 1.9 Existence of skilled professional and technical personnel for implementing and supporting SFM
- 1.10 Allocation of adequate budget to institutions responsible for forest management

Planning and monitoring framework

- 1.11 Integration of forests in national and subnational land-use planning
- 1.12 Capacity and mechanisms for management planning and periodic monitoring of implementation
- 1.13 Long-term projections, strategies and plans for production PFE and protection PFE
- 1.14 Existence of mechanisms for stakeholder participation in land-use and forest management planning, monitoring and assessment

Economic framework

- 1.15 Existence of sustainable public and private funding mechanisms committed to SFM at the national and subnational level
- 1.16 International public and private funding committed to SFM
- 1.17 Incentives to encourage SFM

Criterion 2: Extent and condition of forests

- 2.1 Extent and percentage of total land area under comprehensive land-use plans
- 2.2 Extent and area of forests committed to production and protection
- 2.3 Extent and area of planted forests by type of use
- 2.4 Extent and percentage of total land area under each forest type
- 2.5 Extent and area of forest by type of ownership
- 2.6 Extent and area of production forests under multiyear forest management plans
- 2.7 Extent and area of protection forests under multiyear forest management plans
- 2.8 Forest area under compliance schemes. Forest area in compliance with certification systems
- 2.9 Change in forest area
- 2.10 Periodic change in forest carbon stock

Criterion 3: Forest ecosystem health and resilience

Addressing threats to, and vulnerabilities of, forests

- 3.1 Threats to forests caused directly by human activities
- 3.2 Area and percentage of deforested forest land by type of human activity
- 3.3 Area and percentage of degraded land by type of human activity
- 3.4 Mechanisms for controlling deforestation and degradation at the national and subnational levels
- 3.5 Vulnerability of forests to natural disturbances—forest area disturbed by natural causes
- 3.6 Existence of a multisectoral consultation framework on climate change that includes forests
- 3.7 Existence of strategies for combating climate change at the national and subnational levels
- 3.8 Funding and implementation of strategies for combating climate change
- 3.9 Monitoring of climate-change impacts on forests

Restoration of degraded forests and land

- 3.10 Existence of strategies for restoring forest landscapes, in line with local needs
- 3.11 Multistakeholder initiatives implemented for forest landscape restoration
- 3.12 Mechanism for monitoring changes in area of degraded forest land
- 3.13 Area of formerly degraded forest or forest land restored

Criterion 4: Forest production

Resources assessment

- 4.1 Extent and percentage of inventoried natural production forests, by type of product
- 4.2 Actual and allowable harvest of wood and non-wood products in natural forests
- 4.3 Inventories in planted production forests, by product
- 4.4 Actual harvest of wood and non-wood products in planted forests
- 4.5 Periodic change in forest carbon stock

Harvesting planning and control procedures

- 4.6 Area of concessions in natural production forests
- 4.7 Area of planted production forests
- 4.8 Annual area of planned harvesting in natural production forests
- 4.9 Annual area of planned harvesting in planted production forests
- 4.10 Annual harvested area in natural production forests
- 4.11 Annual harvested area in planted production forests
- 4.12 Forest product tracking systems or similar control mechanisms
- 4.13 Tracking systems in compliance with certification systems
- 4.14 Existence of systems for monitoring and archiving forest management data

Silviculture in natural and planted forests

- 4.15 Uptake and implementation of reduced impact harvesting principles
- 4.16 Silvicultural systems in natural production forests
- 4.17 Silvicultural management in planted forests
- 4.18 Monitoring of silvicultural systems in natural and planted forests

Criterion 5: Forest biological diversity

Ecosystem diversity

- 5.1 Number and area of terrestrial protected areas, by type
- 5.2 Forest extent in protected areas
- 5.3 Existence of operational mechanisms for the management of buffer zones and connectivity of forest protected areas

Species diversity

- 5.4 Threatened forest-dependent plant and wildlife species
- 5.5 Existence of strategies for conserving plant species diversity in natural tropical forests
- 5.6 Existence of strategies for conserving wildlife species diversity in natural tropical forests
- 5.7 Implementation of ecological monitoring in protected areas

Genetic diversity

- 5.8 *In situ* conservation of genetic variation within specified forest tree species

Biodiversity conservation in production forests

- 5.9 Biodiversity conservation measures in natural production forests
- 5.10 Biodiversity conservation measures in planted forests

Criterion 6: Soil and water protection

Extent of protection

- 6.1 Forest area managed primarily for the protection of soil and water
- 6.2 Implementation of measures for protecting downstream catchment values at the landscape level
- 6.3 Existence of operational mechanisms for involving land-use stakeholders in soil and water protection

Protective functions in production forests

- 6.4 Mechanisms implemented for preventing soil and water degradation in production forests
- 6.5 Area of production PFE considered environmentally sensitive and protected
- 6.6 Mechanisms implemented for preventing soil and water degradation in the PFE
- 6.7 Area managed for protecting soil and water quality in non-PFE

Criterion 7: Economic, social and cultural aspects

Economic aspects

- 7.1 Contribution of the forest sector to national economies
- 7.2 Contribution of the forest sector to employment
- 7.3 Volume of wood production by product category
- 7.4 Volume of non-wood forest production
- 7.5 Value of forest products and environmental services
- 7.6 Processing rate of wood and non-wood forest products

Social and cultural aspects

- 7.7 Existence of procedures for assessing the social and environmental impacts of activities affecting forests
- 7.8 Implementation of environmental and social management plans
- 7.9 Capacity building of the workforce in forest management and forest industry
- 7.10 Procedures to ensure the health and safety of forest workers
- 7.11 Mechanisms for the equitable sharing of the costs and benefits of forest management
- 7.12 Mechanisms for resolving forest management-related disputes between forest stakeholders
- 7.13 Livelihoods of Indigenous Peoples and local communities in PFE forests
- 7.14 Forests reserved for specific cultural, research and educational purposes

Local community and Indigenous Peoples' rights and participation in forest management

- 7.15 Respect for user rights of Indigenous Peoples and local communities over PFE forests
- 7.16 Mechanisms for involving Indigenous Peoples and local communities in forest management
- 7.17 Area of forests managed by Indigenous Peoples and/or local communities for timber and non-timber production
- 7.18 Involvement of Indigenous Peoples and local communities in forest management
- 7.19 Recognition of the forest management knowledge and skills of local communities and Indigenous People

3 Reporting format for C&I-based monitoring, assessment and reporting

Criterion 1: Enabling conditions for sustainable forest management

The necessary enabling conditions for SFM at all scales—national/subnational, landscape and local (forest management unit—FMU)—are political commitment and supportive policies, laws and regulations; conducive economic and financial conditions; appropriate institutions and adequate and equitable governance; adequate and secure forest tenure, access and use rights, including customary and traditional rights; and appropriate planning, monitoring and reporting frameworks.

Policy, legal and governance framework: indicators 1.1–1.3

Forests, especially those in the permanent forest estate (PFE), should be secured, protected and managed in accordance with best management practices involving all stakeholders, in particular Indigenous Peoples and local communities dependent on forests.

Indicator 1.1 Policies, laws and regulations governing forests	National level ✓✓	FMU level ✓	Landscape level ¹ ✗
Proposed monitoring and reporting format			
Framework governing:	Policies	Laws	Regulations
a) National SFM objectives, including production, protection and investment			
b) Mechanisms for cross-sectoral policy coordination			
c) Establishment and security of the PFE			
d) Forest tenure and associated rights			
e) Participation of local communities and other stakeholders in forest management			
f) Control of forest management operations			
g) Control of illegal activities in forest areas			
h) Health and safety of forest workers			
Notes - List all relevant policies, laws and regulations. - For each policy, law and regulation, give a brief description of any sections relevant to a through h. - List significant gaps in the coverage of policies, laws and regulations (taking into account a through h). - List significant changes made to laws, policies and regulations since the previous report.			
1 ✓✓ = fully applicable ✓ = partially applicable ✗ = not applicable			

Indicator 1.2 Policies, laws and regulations governing other terrestrial ecosystems	National level ✓✓	FMU level ✓	Landscape level x
Proposed monitoring and reporting format			
Framework governing:	Policies	Laws	Regulations
a) National objectives for including SFM in other ecosystem-related activities			
b) Coordination mechanisms for intersectoral policies			
c) Inclusion of forest protection in non-forest activities			
d) Land tenure and associated rights			
e) Participation of local communities and other stakeholders in the management of residual forest patches			
Notes - List all relevant policies, laws and regulations. - For each policy, law and regulation, give a brief description of any sections relevant to a through e. - List significant gaps in the coverage of policies, laws and regulations (taking into account a through d). - List significant changes made to laws, policies and regulations since the previous report.			

Indicator 1.3 Policies, laws and regulations governing land management	National level ✓✓	FMU level ✓✓	Landscape level x
Proposed monitoring and reporting format			
Framework governing:	Policies	Laws	Regulations
a) Long-term use rights in land tenure			
b) National land-use plan			
c) Mechanisms for managing land-tenure-related conflicts			
d) Significant changes in land use			
Notes - List all relevant policies, laws and regulations. - For each policy, law and regulation, give a brief description of any sections relevant to a through d. - List significant gaps in the coverage of policies, laws and regulations (taking into account a through d). - List significant changes made to laws, policies and regulations since the previous report.			

Indicator 1.4 Forest tenure and forest ownership categories		National level ✓✓	FMU level ✓	Landscape level ✗
Proposed monitoring and reporting format				
Class	Category	Area (ha)		
PFE	Publicly owned - State (including subnational states or provinces, where applicable), including share designated as leasehold - Municipal/communal or public associations - Other public <i>[please specify]</i>			
	Privately owned - Private investment firms - Foundations - Private associations of smallholders, communities - Individuals/families			
	Indigenous-owned			
Non-PFE	Publicly owned - State (including subnational states or provinces, where applicable), including share designated as leasehold - Municipal/communal or public associations - Other public <i>[please specify]</i>			
	Privately owned - Private investment firms - Foundations - Associations of smallholders, communities - Individuals/families			
	Indigenous-owned			
Notes • Indicate the specific tenure and ownership situation according to the country's legal context. • Where applicable, specify differences between land and tree ownership, and forest carbon ownership. • Distinguish between natural and planted forest.				

Indicator 1.5 Forest governance	National level ✓✓	FMU level ✗	Landscape level ✗
Proposed monitoring and reporting format			
Questions to characterize the indicator	Yes/No	Further information	
a) Does the forest law include a specific statement that constitutes the national (or subnational, where applicable) policy for, or objective of, SFM?			
b) Are the laws governing the use of forest resources consistent and clear?			
c) Do laws recognize traditional and indigenous rights to forest resources?			
d) Are there mechanisms in government to address forest-related policies and implementation cross-sectorally?			
e) Does the law protect non-marketed goods and services (e.g. ecosystem integrity, water quality, cultural resources)?			
f) Are stakeholders able to provide inputs to the creation of forest policies, public forest management plans and subsidiary rules?			
g) Are inventory data, management plans, laws and budgets for state-owned forests easily accessible to the public?			
h) Is the collection, sharing and redistribution of forest taxes, royalties, charges and rents effective?			
i) Does the administration's effort to combat forest crimes encompass the whole forest supply chain (transport, processing and trade)?			
j) Do serious conflicts exist between the state and stakeholders that interfere with forest use?			
k) Does the public have opportunities to report corrupt practices to appropriate authorities?			
l) Are there regular audits of the forest agencies, and is action taken on the findings?			
m) Do communication strategies and feedback mechanisms exist to increase awareness of SFM?			
Notes			
• Based on national consultation processes as appropriate.			

Indicator 1.6 Existence of stakeholder participation mechanisms for forest management decision-making	National level ✓✓	FMU level ✗	Landscape level ✗
Proposed monitoring and reporting format			
Questions to characterize the indicator	Yes/No	Further information	
a) Are the institutions responsible for SFM organized based on a clear definition of responsibilities?			
b) Are there partnerships with other institutions involved in efforts impacting forest management?			
c) Do laws recognize traditional and indigenous rights to forest resources?			
d) Do clear procedures exist in government for governing the implementation of SFM activities?			
e) Is there a monitoring and evaluation mechanism for ensuring the appropriate implementation of actions?			
f) Do evaluations result in sanctions/awards determined through consensus?			
g) Are there arrangements to ensure that non-compliances reported during monitoring and evaluation are remedied?			
Notes • Based on national consultation processes, as appropriate.			

Institutional framework: indicators 1.7–1.10

Appropriate and capable institutions with effective linkages between them are essential for SFM. Well-organized implementing agencies and research and educational institutions with sufficient appropriately trained personnel are needed to ensure that forests are managed in accordance with scientific, technical, socioeconomic and traditional knowledge.

Indicator 1.7 Institutions responsible for SFM	National level ✓✓	FMU level ✓	Landscape level X
Proposed monitoring and reporting format			
Institutions	Name		Nature of responsibilities
Primary ministry in charge of forest management			
Other public [please specify]			
Semi-public (e.g. public enterprises)			
Supporting			
Other [please specify]			
Notes			
- Describe public institutions (e.g. forest agencies and enterprises) with primary responsibilities for forest management, wildlife resources, REDD+, etc. “Other” institutions may include, for example, ministries and public agencies dealing with aspects relevant to forest management, such as environment, energy and water; educational, training and research organizations; private-sector organizations (e.g. producer organizations); civil-society organizations; the informal sector; and financial and investment institutions.			

Indicator 1.8 Institutions responsible for forest control	National level ✓✓	FMU level ✓	Landscape level ✗
Proposed monitoring and reporting format			
Institutions	Name	Nature of responsibilities	
Main divisions of the ministry in charge of forest control			
Other public [please specify]			
Semi-public (e.g. public enterprises)			
Independent monitoring of forestry activities			
Other [please specify]			
Notes			
- Describe public institutions (e.g. forest agencies and enterprises) with primary responsibilities for forest management, wildlife resources, REDD+, etc. “Other” institutions may include, for example, ministries and public agencies dealing with aspects relevant to forest management, such as environment, energy and water; educational, training and research organizations; private-sector organizations (e.g. producer organizations); civil-society organizations; the informal sector; and financial and investment institutions.			

Indicator 1.9 Existence of skilled professional and technical personnel for implementing and supporting SFM	National level ✓✓	FMU level ✓✓	Landscape level x
Proposed monitoring and reporting format			
<i>Category of personnel</i>	<i>Public [number]</i>	<i>Private [number]</i>	
Forest management			
Professionals in forest management (university-educated/technical)			
Trained forest workers in forest management			
Forest-based research and forest-based education			
Others <i>[please specify]</i>			
TOTAL			
Downstream forest product industries and trade			
Professionals in forest management (university-educated/technical)			
Trained workers			
Other indirect employment <i>[please specify]</i>			
TOTAL			
Notes			
• Forest management encompasses forest management planning, the implementation of forest management plans, and monitoring, assessment and reporting, including administrative duties. • As per indicator 1.4, “public” comprises the primary ministry in charge of forest management, semi-public institutions, and those public institutions listed in “other”; it also encompasses forestry administration, research and education. • “Private” includes forest concessions, private operations, professional organizations, non-governmental organizations (NGOs), etc.			

Indicator 1.10 Allocation of adequate budget to institutions responsible for forest management	National level ✓✓	FMU level ✓✓	Landscape level ✗
Proposed monitoring and reporting format			
Funding sources	Public amount (USD 000);	Private amount (USD 000);	
Forest management			
Institutions responsible for SFM			
Institutions responsible for vocational training			
Institutions responsible for forestry research			
NGOs			
Other [please specify]			
Notes			
• Forest management encompasses forest management planning, the implementation of forest management plans, and monitoring, assessment and reporting, including administrative duties. • As per indicator 1.4, “public” comprises the primary ministry in charge of forest management, semi-public institutions, and those public institutions listed in “other”; it also encompasses forestry administration, research and education. • “Private” includes forest concessions, private operations, professional organizations, NGOs, etc. • NGOs include national/international NGOs. • Provide the exchange rate if reported in national currency.			

Planning and monitoring framework: indicators 1.11–1.14

Planning is needed at the landscape scale—that is, over areas large enough to be resilient in the face of environmental change and to maintain ecological integrity. Landscape-scale planning is essential for the sustainable management of natural resources, including forests, and it requires coordinated interinstitutional action and the participation of diverse stakeholders. Planning for SFM thus needs an adequate framework, combined with the use of appropriate technologies and effective monitoring and control.

Indicator 1.11 Integration of forests in national and subnational land-use planning	National level ✓✓	FMU level ✓	Landscape level ✓✓
<i>Proposed monitoring and reporting format</i>			
Land-use policies and planning			
Notes • Describe the mechanisms used to formulate land-use policies aimed at the conservation and sustainable use of natural resources, including land, soils, forests and water. • Describe the extent to which SFM planning is part of landscape-level planning. • Describe how multiple-use forest management is integrated into wider land-use planning. • List the major constraints encountered in the integration of forests in land-use planning.			

Indicator 1.12 Capacity and mechanisms for management planning and periodic monitoring of implementation	National level ✓✓	FMU level ✓✓	Landscape level ✗
Proposed monitoring and reporting format			
Capacity and mechanisms			
Notes • Describe the mechanisms used for planning SFM (including periodic monitoring, evaluation and feedback on progress). • Describe how periodic national and subnational forest resource assessments are carried out and how data are used. • Describe how multiyear forest management plans are developed and used for management planning at the FMU level. • Describe the capacity available and institutions responsible for management planning and monitoring. • List the major constraints encountered in management planning and monitoring.			

Indicator 1.13 Long-term projections, strategies and plans for production PFE and protection PFE	National level ✓✓	FMU level ✗	Landscape level ✓✓
Proposed monitoring and reporting format			
Production PFE (including expanded use of planted forest)	[Textual response, with estimates in hectares, if possible]		
Protection PFE (including expanded use of planted forest for protection purposes)	[Textual response, with estimates in hectares, if possible]		
Notes			
• Describe projections (five years and beyond), strategies or plans for production (including expanded use of planted forest) to bring the management of harvesting practices and patterns into alignment with SFM objectives and forest protection, based on categories as described in annexes 3, 4 and 5 of ITTO (2016).			

Indicator 1.14 Existence of mechanisms for stakeholder participation in land-use and forest management planning, monitoring and assessment	National level ✓✓	FMU level ✗	Landscape level ✓✓
Proposed monitoring and reporting format			
List the institutions responsible for stakeholder participation in land-use management planning			
Describe the processes of stakeholder participation, indicating the parties involved and their levels of involvement			
Describe any improvements proposed and any constraints to their introduction			
Notes List the institutions responsible for stakeholder participation in land-use management planning at the landscape scale (for small countries, this may also be the national level).			

Economic framework: indicators 1.15–1.17

One of the most important requirements for achieving SFM is the availability of financial resources (e.g. grants, concessional funding and loans) and the provision of incentives and appropriate economic instruments that promote and support SFM. Capturing the full value of forests, including forest products and environmental services, and ensuring the equitable distribution of costs and benefits, are essential for SFM.

Indicator 1.15 Existence of sustainable public and private funding mechanisms committed to SFM at the national and subnational level	National level ✓✓	FMU level ✗	Landscape level ✗
Proposed monitoring and reporting format			
Source	Amount (USD 000)	Comments (including reference year)	
Public sources – National governments – Subnational governments			
International aid partners – Grants – Loans			
Private sources – Domestic – Foreign			
Notes			
• Provide the exchange rate if reported in national currency. • Indicate if funding is annual or multiyear.			

Indicator 1.16 International public and private funding committed to SFM	National level ✓✓	FMU level ✓	Landscape level ✗
Proposed monitoring and reporting format			
Source	Amount (USD 000)	Comments (including reference year)	
International aid partners – Grants – Loans			
Private sources – Foreign			
NGO and civil-society sources			
Notes • Provide the exchange rate if reported in national currency. • Indicate if funding is annual or multiyear.			

Indicator 1.17 Incentives to encourage SFM	National level ✓✓	FMU level X	Landscape level X
Proposed monitoring and reporting format			
Assess and briefly describe the framework conditions (e.g. legal, policy, institutional) to attract investments in forestry			
Are economic instruments and other incentives being implemented to encourage SFM?			
• If yes, give the name of each economic instrument/ incentive, a brief description and explanation of how it is used, and the main institution(s) and mechanism(s) responsible for its implementation			
Existence of a forest fund to support SFM (natural forests, planted forest). Specify the yearly amount and major use			
Notes			
• Incentives to encourage SFM include financial instruments such as national/bilateral/multilateral aid/financing/ grants/loans/subsidies; financial guarantees; differential/preferential interest rates; tax reductions; and transfer/ compensation payments. They also include other kinds of economic incentives, such as capacity development; market commitment; preferred market access; market recognition (e.g. forest certification); risk mitigation; value adding; recognition and/or restitution of use (tenure/traditional) rights; and gains in efficiency and/or effectiveness.			



Criterion 1: Enabling conditions for sustainable forest management. Photo: ENEF Mbalmayo

Criterion 2: Extent and condition of forests

SFM is a long-term enterprise that depends on the stability and security of the PFE. This criterion lays the foundation for SFM within a well-planned distribution of production and protection forests. It considers the extent and percentage of land under natural and planted forests and the wider context of land-use planning, the need for the conservation of biodiversity and soil and water protection through the maintenance of a range of forest types, and the integrity and condition of forest resources.

Extent and condition of forests: indicators 2.1–2.10

Indicator 2.1 Extent and percentage of total land area under comprehensive land-use plans	National level ✓✓	FMU level ✓	Landscape level ✓✓
Proposed monitoring and reporting format			
Description/title of land-use plan	Total area (ha)	Comments	
Notes			
• Provide the area and percentage of the total land area under comprehensive land-use plans; specify the area classified as PFE in the land-use plan. • Describe the processes for undertaking land-use/landscape planning. • Indicate new trends in land-use planning.			

Indicator 2.2 Extent and area of forests committed to production and protection	National level X	FMU level ✓✓	Landscape level X
Proposed monitoring and reporting format			
	Committed to:		
	Wood (and non-wood forest product) production (ha)	Forest protection (ha)	
Natural forest* - PFE - Non-PFE			
Planted forest* - PFE - Non-PFE			
Area of PFE with boundaries physically demarcated			
Notes			
• * Countries lacking a PFE should complete the non-PFE row. • Indicate the reference year and source. • Indicate the area of privately held forest in the PFE. • Indicate the extent and boundaries of the PFE that are uniquely identified, registered and formally recognized.			

Indicator 2.3 Extent and area of planted forests by type of use	National level X	FMU level ✓✓	Landscape level X
Proposed monitoring and reporting format			
	Committed to:		
	Wood (and non-wood forest product) production (ha)	Forest protection (ha)	
Planted forest - Soil and water protection			
Area of PFE with boundaries physically demarcated			
Notes			
• Indicate the reference year and source. • Indicate the area of privately held forest in the PFE. • Indicate the extent and boundaries of the PFE that are uniquely identified, registered and formally recognized.			

Indicator 2.4 Extent and percentage of total land area under each forest type		National level ✗	FMU level ✓✓	Landscape level ✗
Proposed monitoring and reporting format				
Forest type	Total forest (ha)	%	Part of PFE (ha)	Part of non-PFE (ha)
Total		100		
Notes • Describe the forest (ecological) type classification used. Include azonal (non-climax) forest types (e.g. mangroves, swamp forests, limestone forests, saline forests). • Classifications of forest types based on species composition are more useful than those based on forest structure.				

Indicator 2.5 Extent and area of forest by type of ownership	National level X	FMU level ✓✓	Landscape level X
Proposed monitoring and reporting format			
	Committed to:		
	Wood (and non-wood forest product) production (ha)	Forest protection (ha)	
Natural forest			
- National public			
- Private (corporate entity)			
- Private (natural person)			
- Community			
Planted forest			
- National public			
- Private (corporate entity)			
- Private (natural person)			
- Community			
Notes			
• Indicate the reference year and source. • Indicate the area of planted forest by type of ownership. • Indicate the extent and boundaries of the PFE that are uniquely identified, registered and formally recognized.			

Indicator 2.6 Extent and area of production forests under multiyear forest management plans	National level X	FMU level ✓✓	Landscape level X
Proposed monitoring and reporting format			
	Total forest (ha)	PFE (ha)	Non-PFE (ha)
Production forests: natural forests and natural regeneration forests, including protected areas in production forests - Number of management plans - Area (ha)			
Production forests: planted forests - Number of management plans - Area (ha)			
Describe the effectiveness of implementation of forest management plans. How is implementation monitored?	[Textual response]		
Notes • Management plans include multiyear multipurpose forest management plans to manage forest products and environmental services in natural forest areas and forest management plans in planted forests for any purpose. • Indicate the year(s) to which data apply.			

Indicator 2.7 Extent and area of protection forests under multiyear forest management plans	National level X	FMU level ✓✓	Landscape level X
Proposed monitoring and reporting format			
	Total forest (ha)	PFE (ha)	Non-PFE (ha)
Protection forests: natural forests and natural regeneration forests, including protected areas in production forests - Number of management plans - Area (ha)			
Protected forests (including for soil, water and biodiversity) - Number of management plans - Area (ha) - Purpose of protection			
Describe the effectiveness of implementation of forest management plans. How is implementation monitored?	[Textual response]		
Notes • Management plans include multiyear multipurpose forest management plans to manage forest products and environmental services in natural forest areas and forest management plans in planted forests for any purpose. • Indicate the year(s) to which data apply.			

Indicator 2.8 Forest area under compliance schemes. Forest area in compliance with certification systems	National level ✓✓	FMU level ✓✓	Landscape level ✓✓
Proposed monitoring and reporting format			
	Total forest (ha)	Comments	
Forest management certification - Natural forests, including natural regeneration forests - Planted forests			
Other legality assurance system(s)		[please specify]	
Notes • See definitions of “natural” and “planted” forests in Annex 2 of ITTO (2016). • Natural forest may include assisted natural regeneration, including the second generation of initially planted trees. • Specify the forest management certification schemes in place. • Indicate the year(s) to which data apply.			

Indicator 2.9 Change in forest area	National level ✓✓	FMU level X	Landscape level ✓✓
Proposed monitoring and reporting format			
	Total forest (ha)	PFE (ha)	Non-PFE (ha)
Forest area legally converted to agriculture since previous report <i>[please give year span]</i>			
Forest area legally converted to settlements and infrastructure since previous report <i>[please give year span]</i>			
Forest area legally converted for other purposes <i>[please specify]</i> since previous report <i>[please give year span]</i>			
Area legally converted to forests since previous report <i>[please give year span]</i>			
Estimated forest area deforested illegally since previous report <i>[please give year span]</i>			
Forest area added since previous report <i>[please give year span]</i> : - Planted forest (afforestation) - Natural regrowth (as available)			
Notes - Differentiate, if possible, between PFE and non-PFE. - To the extent possible, the period for which change is reported should immediately follow the period covered in the previous report.			

Indicator 2.10 Periodic change in forest carbon stock	National level ✓✓	FMU level X	Landscape level X
Proposed monitoring and reporting format			
Reference year:	Carbon stock in total forest area (‘000 tonnes)	Carbon stock in PFE (‘000 tonnes)	Carbon stock in non-PFE (‘000 tonnes)
Aboveground			
Belowground			
All five carbon pools			
Indicate the area of “total forest” (ha)			
Describe the method of measurement/formula applied			
Notes The five carbon pools in forests are: 1) aboveground biomass; 2) belowground biomass; 3) dead wood; 4) litter; and 5) soil organic matter.			



Criterion 2: Extent and condition of forests. *Photo: A. Walmsley/TRAFFIC*

Criterion 3: Forest ecosystem health and resilience

Natural tropical forests and planted forests can be affected by a variety of human actions, such as encroachment, illegal harvesting, human-induced fire, pollution and contamination, animal grazing, mining, poaching, invasive species and the spread of pests. Forests are also affected by natural phenomena, such as extreme weather events (e.g. severe winds, heavy rainfall, flooding and drought), wildfire, and pests and diseases. SFM requires attention to forest health, which may include restoring vulnerable and degraded forests and taking measures to increase the resilience of forest ecosystems.

Addressing threats to, and vulnerabilities of, forests: indicators 3.1–3.9

There is concern in tropical countries about the impacts of climate change and climate variability on forest health. Approaches are needed to monitor the threats to, and vulnerability of, forest ecosystems. Specific management practices may be required to monitor damage, keep abreast of emerging threats, and determine when interventions are necessary.

Indicator 3.1 Threats to forests caused directly by human activities		National level ✓✓	FMU level ✓✓	Landscape level ✓✓	
Proposed monitoring and reporting format					
List the five major direct human threats on forests (in particular in the PFE)					
	Direct human threats on forests	Area affected (ha)	Control procedures	Area of control (ha)	Estimated effectiveness
1					
2					
3					
4					
5					
Describe the extent and nature of forest encroachment, degradation and disturbance caused by humans and the control procedures applied					
List the invasive species observed in forests, identify the species of greatest concern, and indicate the measures undertaken to control invasive species					
Notes					
• If appropriate, indicate the institutions responsible for implementing control procedures. • In “estimated effectiveness”, list constraints in implementing control procedures and any proposed improvements.					

Indicator 3.2 Area and percentage of deforested forest land by type of human activity	National level X	FMU level ✓✓	Landscape level X
<i>Proposed monitoring and reporting format</i>			
	<i>Total forest (ha)</i>	<i>PFE (ha)</i>	<i>Non-PFE (ha)</i>
Natural production forests: natural forests and natural regeneration forests, including protected areas in production forests - Number of management plans - Area (ha)			
Natural protection forests: - Number of management plans - Area (ha)			
Planted forests for production (including for timber, construction timber and woodfuel) - Number of management plans - Area (ha) - Purpose of protection			
Planted forests for protection (including for soil, water and biodiversity) - Number of management plans - Area (ha) - Purpose of protection			
Notes • Management plans include multiyear multipurpose forest management plans to manage forest products and environmental services in natural forest areas and forest management plans in planted forests for any purpose. • Indicate the year(s) to which data apply.			

Indicator 3.3 Area and percentage of degraded land by type of human activity	National level X	FMU level ✓✓	Landscape level X
Proposed monitoring and reporting format			
	Total forest (ha)	PFE (ha)	Non-PFE (ha)
Natural production forests: natural forests and natural regeneration forests, including protected areas in production forests - Number of management plans - Area (ha)			
Artificial production forests: planted forests - Number of management plans - Area (ha)			
Protection forests (including for soil, water and biodiversity) - Number of management plans - Area (ha) - Purpose of protection			
Describe the effectiveness of implementation of forest management plans. How is implementation monitored?	[Textual response]		
Notes • Management plans include multiyear multipurpose forest management plans to manage forest products and environmental services in natural forest areas and forest management plans in planted forests for any purpose. • Indicate the year(s) to which data apply.			

Indicator 3.4 Mechanisms for controlling deforestation and degradation at the national and subnational levels		National level ✓✓	FMU level ✓✓	Landscape level ✓✓	
Proposed monitoring and reporting format					
List the five most important forest restoration mechanisms					
	Major natural disturbances	Area affected (ha)	Control procedures	Area of control (ha)	Estimated effectiveness
1					
2					
3					
4					
5					
Describe the listed natural and artificial restoration mechanisms and corrective measures taken to strengthen forest resilience to biotic and abiotic stress			[Textual response]		
Describe the measures taken to strengthen the capacity of forest managers for addressing new and emerging issues in connection with forest health and resilience			[Textual response]		
Notes					
• Indicate the extent and nature of restoration and disturbances of natural origin, and the control procedures applied. • Indicate the institutions responsible for implementing control procedures. • List constraints in implementing control procedures and any proposed improvements.					

Indicator 3.5 Vulnerability of forests to natural disturbances— forest area disturbed by natural causes		National level ✓✓	FMU level ✓✓	Landscape level ✓✓	
Proposed monitoring and reporting format					
List the five most important natural disturbances that make forests vulnerable					
	Major natural disturbances	Area affected (ha)	Control procedures	Area of control (ha)	Estimated effectiveness
1					
2					
3					
4					
5					
Describe the causes of listed natural disturbances and corrective measures taken to reduce forest vulnerability to biotic and abiotic stressors			[Textual response]		
Describe the measures taken to strengthen the capacity of forest managers to address new and emerging issues in connection with forest health and resilience			[Textual response]		
Notes					
• Indicate the extent and nature of degradation and disturbances of natural origin and the control procedures applied. • Indicate the institutions responsible for implementing control procedures. • List constraints in implementing control procedures and any proposed improvements.					

Indicator 3.6 Existence of a multisectoral consultation framework on climate change that includes forests	National level ✓✓	FMU level x	Landscape level ✓✓
Proposed monitoring and reporting format			
List the institutions responsible for stakeholder participation in land-use management planning			
Describe the processes of stakeholder participation, indicating the parties involved and their levels of involvement			
Describe the approaches followed for integrating non-involved stakeholders and updating them about decisions made and actions undertaken			
Describe the approaches followed for consensus-building and decision-making where consensus is lacking			
Describe any improvements proposed and constraints to their introduction			
Notes			
• List the institutions responsible for stakeholder participation in land-use management planning at the landscape scale (for small countries, this may also be the national level).			

Indicator 3.7 Existence of strategies for combating climate change at the national and subnational levels	National level ✓✓	FMU level x	Landscape level ✓✓
<i>Proposed monitoring and reporting format</i>			
List the institutions responsible for developing strategies for combating climate change			
Describe the processes of stakeholder participation in strategy development, indicating the parties involved and their levels of involvement			
Describe the process for validating and disseminating the strategies to ensure its ownership by all relevant stakeholders			
Notes List the institutions responsible for stakeholder participation in strategy development at the landscape scale (for small countries, this may also be the national level).			

Indicator 3.8 Funding and implementation of strategies for combating climate change	National level ✓✓	FMU level x	Landscape level ✓✓
Proposed monitoring and reporting format			
List the institutions involved in funding the strategies for combating climate change			
Describe the processes for ensuring consistency between the parties involved and their levels of involvement			
Describe any improvements proposed and any constraints to their introduction			
Notes List the institutions responsible for stakeholder participation in funding the development of the strategies for combating climate change at the landscape scale (for small countries, this may also be the national level).			

Indicator 3.9 Monitoring of climate-change impacts on forests	National level ✓✓	FMU level X	Landscape level ✓✓
Proposed monitoring and reporting format			
List the institutions responsible for monitoring the impacts of climate change			
Describe the processes and methods used for monitoring, indicating the parties involved and their levels of involvement			
Describe any improvements proposed and constraints to their introduction			
Notes List the institutions responsible for monitoring the impacts of climate change at the landscape scale (for small countries, this may also be the national level).			

Restoration of degraded forests and lands: indicators 3.10–3.13

Forest landscape restoration (FLR) is an emerging approach that encourages the involvement of stakeholders in all affected land-use sectors as well as participatory decision-making. The objective of FLR is to restore degraded landscapes to a healthy and productive state in order to fulfil the needs of people and the environment in a sustainable fashion. FLR makes use of collaborative approaches to harmonize the land-use decisions of stakeholders with the aims of restoring ecological integrity, forest resilience and economic productivity and enhancing the socioeconomic development of local communities.

Indicator 3.10 Existence of strategies for restoring forest landscapes, in line with local needs	National level ✓✓	FMU level ✗	Landscape level ✓✓
Proposed monitoring and reporting format			
	Yes/No	Comments	
Have there been efforts to assess the degree of forest degradation at the landscape level and to identify restoration opportunities?			
Has a baseline study been conducted to assess the causes of degradation?			
Are field-level FLR activities being conducted? If yes, please indicate the area involved and describe the measures taken			
Are local stakeholders involved in the development of restoration strategies and their implementation? If yes, please describe such involvement			
Are local stakeholders involved in the participatory monitoring of landscape restoration activities?			
Has a national/subnational forest restoration strategy/plan been formulated?			
• If yes, is the strategy/plan being implemented?			
– If yes, what is the scale and timeframe of the effort, and what percentage of area has been restored in recent (e.g. previous three) years?	[Textual response]		

Indicator 3.11 Multistakeholder initiatives implemented for forest landscape restoration	National level ✓✓	FMU level ✗	Landscape level ✓✓
Proposed monitoring and reporting format			
	Yes/No	Comments	
Is there a consultation framework at the level of key stakeholders in a given landscape to discuss issues related to degradation and restoration approaches?			
Is there a schedule of regular meetings which is shared and known by all stakeholders?			
Do stakeholders contribute to the funding of exchanges according to their size and capacity?			
Are visits held to share success stories in the field of restoration? If yes, please describe the nature of such involvement			

Indicator 3.12 Mechanism for monitoring changes in area of degraded forest land	National level ✓✓	FMU level X	Landscape level ✓✓
Proposed monitoring and reporting format			
	Yes/No	Comments	
Are there institutions responsible for monitoring the area of degraded forest land?			
Are periodic reports on degraded land monitoring produced and consolidated at the landscape level?			

Indicator 3.13 Area of formerly degraded forest or forest land restored	National level ✓✓	FMU level x	Landscape level ✓✓
Proposed monitoring and reporting format			
	Area (ha)	Comments	
Total area restored (three-year period) <i>[please indicate applicable years]</i>			
Total area restored through natural regeneration/combination of enrichment (three-year period) <i>[please indicate applicable years]</i>			
Total area restored through plantations, including in agroforestry systems (three-year period) <i>[please indicate applicable years]</i>			
Are visits held to share success stories in the field of restoration? If yes, please describe the nature of such involvement			
Notes • Where possible, indicate the area of forest land restored with planted forests and woodlots, the area of forest land restored through (assisted) natural regeneration, the area of degraded forest restored through silvicultural practices, the area of land restored with agroforestry systems, and the area of land restored with improved fallows.			



Criterion 3: Forest ecosystem health and resilience. Photo: DGFRN, Benin

Criterion 4: Forest production

This criterion addresses the objective of maintaining the multiple functions of forests and their capacity to deliver products and environmental services. Such functions and capacity can only be sustained in the long term if forest management is economically and financially viable, environmentally sound and socially acceptable.

Forests earmarked for timber production are able to fulfil a number of other important functions, such as environmental protection, carbon storage and the conservation of species and ecosystems. These multiple roles should be safeguarded by the application of sound management practices that maintain the potential of the forest resource to yield the full range of benefits to society.

Resources assessment: indicators 4.1–4.5

Forest resource assessments carried out periodically are vital for ensuring the sustainable production of forest goods and environmental services for society. They provide information not only on the quantities of wood and non-wood products that may be harvested sustainably but also on other forest values and how those might change over time.

Indicator 4.1 Extent and percentage of inventoried natural production forests, by type of product	National level ✗	FMU level ✓✓	Landscape level ✗	
Proposed monitoring and reporting format				
Area inventoried [please give reference year]	PFE		Non-PFE (ha)	
	ha	%	ha	%
Timber (industrial roundwood)				
Other wood (locally used, woodfuel)				
Non-wood forest products				
Total inventoried area				
Notes				
• Indicate the extent and percentage of forest for which inventory and survey procedures have been used to determine the quantity of the main forest products (e.g. wood, fibre, gums, saps, food animals and plants, and medicines).				

Indicator 4.2 Actual and allowable harvest of wood and non-wood products in natural forests				National level ✓✓	FMU level ✓✓	Landscape level ✗	
Proposed monitoring and reporting format							
	Total forest area (i.e. PFE + non-PFE)			PFE		Non-PFE	
	Number of species harvested	Top five species harvested, by volume		Annual actual harvest	Annual allowable harvest	Annual actual harvest	Annual allowable harvest
Timber (industrial roundwood)		1		m ³	m ³	m ³	m ³
		2		m ³	m ³	m ³	m ³
		3		m ³	m ³	m ³	m ³
		4		m ³	m ³	m ³	m ³
		5		m ³	m ³	m ³	m ³
Other wood (e.g. locally used; woodfuel)		1		m ³	m ³	m ³	m ³
		2		m ³	m ³	m ³	m ³
		3		m ³	m ³	m ³	m ³
		4		m ³	m ³	m ³	m ³
		5		m ³	m ³	m ³	m ³
Non-wood forest products [please specify]		1		kg	kg	kg	kg
		2		kg	kg	kg	kg
		3		kg	kg	kg	kg
		4		kg	kg	kg	kg
		5		kg	kg	kg	kg
Notes							
- Indicate average harvesting levels for the most recent three-year period for which data are available (give the source of the data and the unit of measurement). - Describe the method for estimating the annual allowable cut for industrial roundwood.							

Indicator 4.3 Inventories in planted production forests, by product		National level ✗	FMU level ✓✓	Landscape level ✗
Proposed monitoring and reporting format				
Area inventoried [please give reference year]	PFE		Non-PFE (ha)	
	ha	%	ha	%
Timber (industrial roundwood)				
Other wood (e.g. locally used; woodfuel)				
Non-wood forest products				
Total area inventoried				
Notes Indicate the extent and percentage of forest for which inventory and survey procedures have been used to determine the quantity of the main forest products (e.g. wood, fibre, gums, saps, food animals and plants, and medicines).				

Indicator 4.4 Actual harvest of wood and non-wood products in planted forests		National level ✓✓		FMU level ✓✓	Landscape level ✗
Proposed monitoring and reporting format					
	Total annual planted- forest harvest	List the top five species harvested (by volume or weight) for each category, and actual annual harvest			
Timber (industrial roundwood)	m³	1			m³
		2			m³
		3			m³
		4			m³
		5			m³
Other wood (e.g. locally used; woodfuel)	m³	1			m³
		2			m³
		3			m³
		4			m³
		5			m³
Non-wood forest products	kg	1			kg
		2			kg
		3			kg
		4			kg
		5			kg
Notes					
• Indicate the reported average harvest levels over the latest three-year period, together with the source of the data.					

Indicator 4.5 Periodic change in forest carbon stock	National level ✓✓	FMU level ✗	Landscape level ✗
Proposed monitoring and reporting format			
	Forest area (ha)	Tonnes of carbon committed	Timeframe (years)
Forest carbon stocks conserved through the sustainable management of natural forests and forest conservation			
Restoring degraded carbon stocks through the enrichment of degraded forests and guided natural restoration			
Creating new carbon stocks through afforestation and reforestation in non-forested areas			
Notes • Include all forest-related climate-change mitigation programmes, such as REDD+, forest national appropriate mitigation actions (NAMAs), nationally determined contributions, Clean Development Mechanism Afforestation/Reforestation. • Where possible, distinguish on the basis of the currently applied REDD+ strategy.			

Harvesting planning procedures in natural forests should enable good technical control, provide safe and healthy working conditions, minimize costs, and reduce environmental impacts. Sound and effective harvest planning procedures will help ensure that forest investments yield adequate financial, economic and social returns while minimizing environmental damage.

Indicator 4.6 Area of concessions in natural production forests		National level x	FMU level ✓✓	Landscape level x		
Proposed monitoring and reporting format						
Natural forest harvesting contracts [please indicate reference year]	Total number of contracts	Total area contracted (ha)	Smallest/ largest area contracted (ha)	Duration of contract (years)	Annual allowable harvest and area of harvest (m ³ ; ha)	Annual actual harvest (volume and area) (m ³ ; ha)
Long-term private concessions						
Long-term community concessions						
Medium-term logging concessions/contracts						
Short-term logging permits (area-based)						
Short-term logging permits (volume- based)						
Other [please specify]						
Notes						
• Specify the main terms of the various natural forest harvesting contracts in place. • Indicate the share of harvesting contracts operating under multiyear forest management plans. • Indicate the share of other official harvesting permits (small-, medium- and large-scale permits) operating without forest management plans.						

Indicator 4.11 Annual harvested area in planted production forests			National level x	FMU level ✓✓	Landscape level x	
Proposed monitoring and reporting format						
Planted forest harvesting contracts [please indicate reference year]	Total number of contracts	Total area contracted (ha)	Smallest/ largest area contracted (ha)	Duration of contract (years)	Annual allowable harvest and area of harvest (m³; ha)	Annual actual harvest (volume and area) (m³; ha)
Long-term private concessions						
Long-term community concessions						
Medium-term logging concessions/contracts						
Short-term logging permits (area-based)						
Short-term logging or thinning permits (volume-based)						
Other [please specify]						
Notes						
- Specify the main terms of the various planted forest harvesting contracts in place. - Indicate the share of harvesting contracts operating under multiyear forest management plans. - Indicate the share of other official harvesting permits (small-, medium- and large-scale permits) operating without forest management plans.						

Indicator 4.12 Forest product tracking systems or similar control mechanisms		National level ✓✓		FMU level ✗		Landscape level ✓✓	
Proposed monitoring and reporting format							
Type of tracking	System in place [Yes/No]	Responsible institution(s)			Comments (e.g. scale of application, efficiency)		
Log tracking (from stump to processing unit)							
Wood tracking (from processing unit to port/end-user)							
Tracking of other forest products (e.g. wild meat, wildlife, charcoal, other non-wood forest products) [please specify]							
Notes							
• In comments, describe the type(s) of system, and implementation (e.g. responsible parties, scope and scale).							

Indicator 4.13 Tracking systems in compliance with certification systems	National level ✓✓	FMU level x	Landscape level ✓✓
Proposed monitoring and reporting format			
<i>Type of tracking</i>	<i>FSC</i>	<i>PEFC</i>	<i>Other legality and tracking systems</i>
Log tracking (from stump to processing unit) according to forest certification system			
Wood tracking (from processing unit to port/end-user) according to forest certification system			
Tracking of other forest products (e.g. wild meat, wildlife, charcoal, other non-wood forest products) according to forest certification system <i>[please specify]</i>			
Notes In comments, describe the type(s) of system, and implementation (e.g. responsible parties, scope and scale).			

Indicator 4.14 Existence of systems for monitoring and archiving forest management data	National level ✓✓	FMU level ✓✓	Landscape level ✓
Proposed monitoring and reporting format			
	<i>Natural forests</i>	<i>Planted forests</i>	
Describe the availability of historical records on the extent, nature and management of forests (nationally, subnationally, locally)			
Do archives of forest data (e.g. growth, yield, health and uses) exist, and are they accessible for forest planning and management?			
Have permanent sample plots been established? If yes, specify when they were established and the year of most-recent re-measurement			
Notes In many countries, records exist of historical forest trials and measurements of the growth of tree species, as well as of harvesting and silvicultural practices in natural and planted forests. Such records have often been neglected, but they could be valuable sources of information on the long-term behaviour and growth of tree species and forest stands.			

Silviculture in natural and planted forests: indicators 4.15–4.18

The provision of clear silvicultural guidelines helps ensure that all forest operations are carried out according to high standards. In natural forests, these may encompass harvesting inventories as a means for establishing sustainable cutting levels (for wood and non-wood forest products), inventories for assessing the condition of forests after harvesting, and the types of silvicultural treatments required to ensure adequate regeneration and long-term forest health. Guidance is also needed to reduce forest damage caused by harvesting, as well as on silviculture in planted forests, forest restoration, and procedures for the monitoring and evaluation of management practices.

Indicator 4.15 Uptake and implementation of reduced impact harvesting principles	National level x	FMU level ✓✓	Landscape level ✓
Proposed monitoring and reporting format			
	Natural forests	Planted forests	
Describe existing harvesting systems and guidelines, and the extent to which they are being implemented			
Describe existing silvicultural systems and guidelines, and the extent to which they are being implemented			
Indicate the extent to which reduced impact harvesting and silvicultural treatments are being monitored, including by whom and at what geographical scale			
Indicate the extent to which monitoring data are being archived to allow the evaluation of the cumulative effects of harvesting systems and silvicultural treatments over time			
Describe post-harvesting surveys to assess the effectiveness of harvesting and silvicultural activities to enhance forest stands and tree regeneration establishment and the monitoring of silvicultural treatments			
Notes			
• A silvicultural system is a process by which forest trees are tended, removed and replaced by new trees. Silviculture comprises all operations used in manipulating forest stands, including harvesting operations			

Indicator 4.16 Silvicultural systems in natural production forests	National level X	FMU level ✓✓	Landscape level X
Proposed monitoring and reporting format			
Silvicultural issues in natural forests	Indicate the approaches taken		
Selective thinning techniques used in natural forests			
Liana cutting methods and techniques used before logging			
Enrichment planting in gaps and depleted areas			
Notes			
• Defining the specific silvicultural and operational treatments for natural forest management is important, whether it is for productive or protective functions, or a combination of these.			

Indicator 4.17 Silvicultural management in planted forests	National level X	FMU level ✓✓	Landscape level X
Proposed monitoring and reporting format			
Silvicultural issues in planted forests		Indicate the approaches taken	
Species selection for planted forests (e.g. whether local species, introduced species, including consideration of invasive species, source of planting materials)			
Use of biotechnology and genetic modification of species			
Selection of the silvicultural treatment and maintenance of planting sites beyond first rotation			
Control of pests and diseases (e.g. use of herbicides, pesticides, fungicides and other chemicals)			
Use of fertilizers (nursery, afforestation sites)			
Fire control			
Water management in planted forest landscapes			
Notes			
• Defining the specific silvicultural and operational treatments for planted forest management is important, whether it is for productive or protective functions, or a combination of these.			

Indicator 4.18 Monitoring of silvicultural systems in natura and planted forests	National level ✓✓	FMU level ✓✓	Landscape level ✓
Proposed monitoring and reporting format			
Describe the system in place for strategically monitoring the impacts of harvesting and the implementation of the silvicultural system			
Silvicultural system at FMU level	Total area per year (ha)		
Natural production forest (PFE) (natural forest timber concessions, licences, community harvesting, non-wood forest product harvesting)			
– Area over which yield control is applied			
– Area over which pre-harvesting operations are applied			
– Area over which post-harvesting operations are applied			
– Area over which silvicultural treatments to induce or assist natural regeneration are applied			
– Area over which enrichment planting [please specify main species] is performed			
Describe the system in place for strategically monitoring the impacts of harvesting and the implementation of the silvicultural system			
Silvicultural system at FMU level	Total area per year (ha)		
Planted forest (PFE) (Industrial plantations producing timber/fibre/woodfuel; community plantations; protective planting)			
– Tending and thinning in monospecific plantations [please specify main species used]			
– Tending and thinning in multispecies plantations [please specify mix of species used]			
– Replacement of forest stand after harvesting [please indicate the % of replacement]			
Notes			
• Strategic monitoring provides data on the long-term effects of forest operations so that potential problems can be identified and resolved. To guide silvicultural decisions, a simple assessment method (diagnostic sampling) can be applied at the FMU level to determine the need for specific treatment. • Indicate the reference year. • Common treatments to induce or assist natural regeneration include tending natural regeneration, soil scarification, prescribed burning, the liberation of future crop trees, thinning, liana cutting and enrichment planting.			



Criterion 4: Forest production. *Photo: Kennedy Owusu Afriyie*

Criterion 5: Forest biological diversity

This criterion relates to the conservation and maintenance of biodiversity, including ecosystem, species and genetic diversity, with an emphasis on biodiversity conservation in production forests and at the landscape scale. The *ITTO/IUCN Guidelines for the Conservation and Sustainable Use of Biodiversity in Tropical Timber Production Forests* (ITTO/IUCN 2009) are designed to support the monitoring of biodiversity in forest landscapes. The general principles and definitions used here are those established by the Convention on Biological Diversity and the International Union for Conservation of Nature (IUCN).

Ecosystem diversity: indicators 5.1–5.3

The conservation of ecosystem diversity can best be accomplished by maintaining functional landscapes and through the establishment and management of a system of protected areas (combinations of IUCN categories I–VI) containing representative samples of all forest types linked as far as possible by biological corridors or stepping stones. This can be ensured by effective land-use policies and systems for choosing, establishing and maintaining the integrity of protected areas in consultation with and through the involvement of local communities.

Indicator 5.1 Number and area of terrestrial protected areas, by type	National level ✓✓	FMU level ✓	Landscape level ✗	
Proposed monitoring and reporting format				
a. Forest protected areas	IUCN protected-area category			
	Total	I–II	III–IV	V, VI
Number of protected areas (not necessarily forested; excluding sea)				
Range in size (smallest to largest protected area; ha)				
Area of forest in protected areas (ha)				
Area of ecological forest types represented in protected areas <i>[please specify]</i>				
Ecological forest types considered to be underrepresented in protected areas <i>[please specify]</i>	<i>[Textual response]</i>			
b. Forest conservation concessions				
If not included in (a), indicate the number and area of forest conservation concessions, and their status and duration				
Notes				
• The area of forest in protected areas constitutes the protection PFE. • Forest conservation concessions are areas within production forests allocated to conservation organizations for conservation purposes (and in which wood production is excluded). Although formally production forests, such areas should be reported here as protected areas, albeit only for the period of the leases.				

Indicator 5.2 Forest extent in protected areas	National level ✓✓	FMU level ✓	Landscape level ✗	
Proposed monitoring and reporting format				
a. Forest protected areas	IUCN protected-area category (ha)			
	Total	I–II	III–IV	V, VI
Number of protected areas (not necessarily forested; excluding sea)				
Range in size (smallest to largest protected area; ha)				
Area of forest in protected areas (ha)				
Area of ecological forest types represented in protected areas [please specify]				
Ecological forest types considered to be underrepresented in protected areas [please specify]	[Textual response]			
b. Forest conservation concessions				
If not included in (a), indicate the number and area of forest conservation concessions, and their status and duration				
Notes				
• The area of forest in protected areas constitutes the protection PFE. • Forest conservation concessions are areas within production forests allocated to conservation organizations for conservation purposes (and in which wood production is excluded). Although formally production forests, such areas should be reported here as protected areas, albeit only for the period of the leases.				

Indicator 5.3 Existence of operational mechanisms for the management of buffer zones and connectivity of forest protected areas	National level ✓✓	FMU level ✓	Landscape level ✗
Proposed monitoring and reporting format			
<i>IUCN category</i>	<i>Areas of buffer zone managed (ha)</i>	<i>Number of forested protected areas connected</i>	<i>Description</i>
I–II			
III–IV			
V–VI			
Describe the national or subnational strategy for ensuring (or increasing) connectivity between forested protected areas			

Species diversity: indicators 5.4–5.7

In strategies for preventing species from becoming rare, threatened, endangered or extinct, it is important to have national/subnational procedures for monitoring and protecting species diversity. Emphasis should be given to the monitoring of key tree species in production forests.

Indicator 5.4 Threatened forest-dependent plant and wildlife species		National level ✓✓	FMU level ✓	Landscape level ✗	
Proposed monitoring and reporting format					
Forest-dependent species group	Total number of species	Of which:			List the three most important species (keystone species)
		Threatened	Legally protected at national level	Endemic	
Trees					
Flowering plants					
Ferns					
Mammals					
Birds					
Reptiles					
Amphibians					
Freshwater fish					
Butterflies					
Others <i>[please specify]</i>					
Notes • Indicate sources. • “Threatened” includes vulnerable, endangered or critically endangered according to the IUCN Red List.					

Indicator 5.5 Existence of strategies for conserving plant species diversity in natural tropical forests	National level ✗	FMU level ✓✓	Landscape level ✗
Proposed monitoring and reporting format			
Comment on whether there have been declines in populations of key tree species (e.g. high-value commercial species)			
List the major commercial tree species (wood and non-wood forest products) for which conservation status has changed in the last five years			
Describe measures (in FMUs) for analyzing the conservation status of tree species and interventions (e.g. age and diameter-class distribution of key species)			
List the tree species in each Appendix of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)			
Describe the measures undertaken to maintain species diversity at the FMU level, in particular the most commonly used wood and non-wood product species			
Describe procedures undertaken to maintain the stock of major wood and multipurpose tree species in natural forests			
Indicate the type and area (ha) of <i>in situ</i> conservation of forest tree species nationally			
Notes			
• Describe procedures to identify, list and protect recover/restore threatened species of forest flora and fauna. • List the institutions responsible and describe any recent changes in the procedures.			

Indicator 5.6 Existence of strategies for conserving wildlife species diversity in natural tropical forests	National level X	FMU level ✓✓	Landscape level X
Proposed monitoring and reporting format			
Comment on whether there have been declines in populations of key wildlife species (e.g. high-value special species)			
List the major commercial wildlife species (for fur, feathers, horns, scales and teeth) for which conservation status has changed in the last five years			
Describe measures (in FMUs) for analyzing the conservation status of wildlife species and interventions (e.g. protection of habitats, various methods of surveillance)			
List the wildlife species in each CITES Appendix			
Describe the measures undertaken to maintain species diversity at the FMU level, in particular the most commonly hunted and traded species			
Describe the procedures undertaken to maintain the stock of major multipurpose wildlife species in natural forests			
Indicate the type and area (ha) of <i>in situ</i> conservation of wildlife species nationally			
Notes			
• Describe the procedures to identify, list and protect recover/restore threatened species of fauna. • List the institutions responsible and describe any recent changes in the procedures.			

Indicator 5.7 Implementation of ecological monitoring in protected areas	National level ✓✓	FMU level ✓	Landscape level ✗
Proposed monitoring and reporting format			
	Comments		
Wildlife species identified to serve as indicator species for the conservation of genetic variation			
Plans and projects in place to ensure the <i>in situ</i> and <i>ex situ</i> conservation of the genetic variation of key species of flora and fauna [please specify the species]			
Notes			
• Conserving genetic diversity within tree species with potential economic, environmental, scientific or societal value is essential for ensuring continued ecosystem productivity and health and the capacity of species to adapt to climate change and other environmental change.			

Genetic diversity: indicator 5.8

Biodiversity conservation involves maintaining the genetic diversity of all species of fauna and flora. This may be difficult to ensure in practice, and it is appropriate to focus limited resources on species that are threatened or that have identified commercial value.

Indicator 5.8 <i>In situ</i> conservation of genetic variation within specified forest tree species	National level ✓✓	FMU level ✓	Landscape level ✗
Proposed monitoring and reporting format			
	Comments		
Forest tree species identified to serve as indicator species for the conservation of genetic variation			
Plans and projects in place to ensure the <i>in situ</i> and <i>ex situ</i> conservation of the genetic variation of key species of flora and fauna [please specify the species]			
Notes			
• Conserving genetic diversity within tree species with potential economic, environmental, scientific or societal value is essential for ensuring continued ecosystem productivity and health and the capacity of species to adapt to climate change and other environmental change.			

Biodiversity conservation in production forests: indicators 5.9 and 5.10

Management measures in production forests can make important contributions to biodiversity conservation (for example, logging intensity is directly related to the presence or absence of birds and other seed distributors), which should be fully integrated into forest management plans and harvesting plans.

Indicator 5.9 Biodiversity conservation measures in natural production forests	National level ✗	FMU level ✓✓	Landscape level ✗
Proposed monitoring and reporting format			
	Total area (ha)	% of total	
Area set aside for biodiversity conservation in natural production forests (FMU level)			
Measures for retaining undisturbed areas (FMU level)	[Textual response]		
Procedures for protecting ecologically important features (e.g. nesting sites, seed trees, niches and keystone species)	[Textual response]		
Procedures for protecting particular tree species and other plants for local livelihood needs, cultural values, food security, etc.	[Textual response]		
Average volume of wood harvested (FMU level)	[m ³ per ha per year]		
Notes • In textual responses, indicate the effectiveness of the procedures being monitored. • In textual responses, indicate procedures for assessing changes in biodiversity values in production areas compared with control areas.			

Indicator 5.10 Biodiversity conservation measures in planted forests	National level ✗	FMU level ✓✓	Landscape level ✗
Proposed monitoring and reporting format			
	Average annual area (ha)	Year span	Main species used
Area of planted forest established (three-year average [please specify])			
Afforestation: planted forest on non-forested land (not replacing natural forest habitats)			
Reforestation: planted forest on previously forested sites (e.g. degraded forest and forest land)			
Planted forests established using native tree species			
Describe measures undertaken to conserve native fauna and flora in planted forest landscapes*	[Textual response]		
Notes			
• E.g. Keeping natural sites along waterways, creating biological corridors or stepping stones.			



Criterion 5: Forest biological diversity. Photo: Intu Boedhihartono

Criterion 6: Soil and water protection

This criterion addresses the crucial landscape-scale role of forests in maintaining downstream water quality and flow and controlling flooding and sedimentation. It also pertains to maintaining the productivity and quality of soil and water within forests (and associated aquatic ecosystems) and therefore forest health and condition.

Information on the effects of forest management on soil and water is difficult to obtain and is seldom available for more than a limited number of sites. Valid national indicators should be derived from the aggregation of data from indicators at the landscape and FMU levels, or from the existence and adequate enforcement of national guidelines in conformity with local conditions.

Extent of protection: indicators 6.1–6.3

An essential element of multipurpose forest management is the landscape-scale maintenance of downstream benefits, such as water quality and flow and reductions in flooding and sedimentation.

Indicator 6.1 Forest area managed primarily for the protection of soil and water	National level ✓✓	FMU level ✓	Landscape level ✓✓
Proposed monitoring and reporting format			
	Area (ha)		%
Forest area (natural and planted, PFE and non-PFE) managed primarily for the protection of soil and water			
Forest area (natural and planted, PFE and non-PFE) managed for other protection purposes [please specify purposes]			
Notes			
• Collect national or subnational data. • Other protection purposes might include cultural heritage sites, belts around industrial complexes, military sites, etc. • For each specific purpose, indicate the responsible agencies (e.g. forest agency, environmental agency, water agency, mining agency).			

Indicator 6.2 Implementation of measures for protecting downstream catchment values at the landscape level	National level ✓✓	FMU level ✓	Landscape level ✓✓
Proposed monitoring and reporting format			
Describe the procedures in place in both the PFE and the non-PFE to ensure the protection of downstream catchment values, and the extent to which such procedures are being implemented			
Describe the extent to which forests are integrated into national and regional disaster risk management			
Notes • Trees and forests play fundamental roles in disaster risk management, such as by sustaining water supplies, protecting soils and reducing the impacts of natural hazards such as floods and landslides.			

Indicator 6.3 Existence of operational mechanisms for involving land-use stakeholders in soil and water protection	National level ✓✓	FMU level ✓	Landscape level ✓✓
Proposed monitoring and reporting format			
Describe the procedures in place in both the PFE and the non-PFE to ensure the involvement of land-use stakeholders in soil and water protection			
Describe the efficiency of implemented measures and their replicability			
Notes • Trees and forests play fundamental roles in disaster risk management, such as by sustaining water supplies, protecting soils and reducing the impacts of natural hazards such as floods and landslides.			

Protective functions in production forests: indicators 6.4–6.7

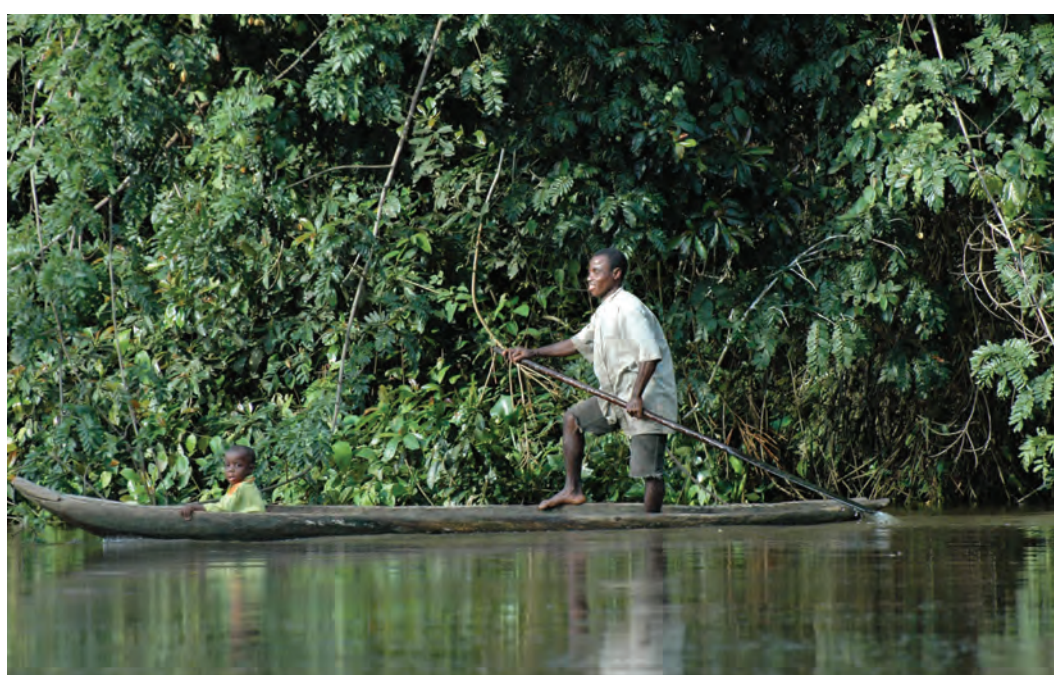
As an integrative part of multipurpose forest management, it is important to ensure effective soil and water management as a way of maintaining the productivity and health of forests and their hydrological regulation functions.

Indicator 6.4 Mechanisms implemented for preventing soil and water degradation in production forests	National level ✗	FMU level ✓✓	Landscape level ✓✓
Proposed monitoring and reporting format			
Describe the procedures in place to protect soil productivity and retain water in production forests			
Describe the extent to which provisions are being applied to prevent the degradation of forest soils and water			

Indicator 6.5 Area of production PFE considered environmentally sensitive and protected	National level ✗	FMU level ✓✓	Landscape level ✗
Proposed monitoring and reporting format			
<i>Area defined as environmentally sensitive (and therefore protected) due to:</i>	<i>Area (ha)</i>	<i>% of production PFE</i>	<i>Comments</i>
Slope/elevation <i>[please specify parameters—e.g. >X%]</i>			
Drinking water sources			
Buffer strips (e.g. along water courses)			
Poor drainage			
Other characteristics <i>[please specify]</i>			

Indicator 6.6 Mechanisms implemented for preventing soil and water degradation in the PFE	National level X	FMU level ✓✓	Landscape level X
Proposed monitoring and reporting format			
In production PFE:			
a) Indicate the measures required to ensure adequate water management (drainage) during and after wood harvesting			
b) Indicate requirements for buffer strips along streams and rivers			
c) Indicate the measures required to minimize soil compaction by harvesting machinery			
d) Indicate the measures required to protect soil from erosion after harvesting operations			
e) Indicate the measures in place to ensure the implementation of a–d			
Notes			
• Are the measures being implemented? Is their effectiveness being monitored? At what geographical scale?			

Indicator 6.7 Area managed for protecting soil and water quality in non-PFE	National level x	FMU level ✓✓	Landscape level x
Proposed monitoring and reporting format			
<i>Area defined as environmentally sensitive (and therefore protected) due to:</i>	<i>Area (ha)</i>	<i>% of production PFE</i>	<i>Comments</i>
Slope/elevation [please specify parameters—e.g. >X%]			
Drinking water sources			
Buffer strips (e.g. along water courses)			
Poor drainage			
Other characteristics [please specify]			



Criterion 6: Soil and water protection. Photo: Intu Boedhihartono

Criterion 7: Economic, social and cultural aspects

This criterion deals with the economic, social and cultural aspects of forests. A well-managed forest is a self-renewing resource that produces a host of benefits for people. For example, forests provide opportunities for recreation and ecotourism and generate employment and investment in processing industries. Sustainably managed forests, therefore, can make important contributions to the overall sustainable development of countries.

Economic aspects: indicators 7.1–7.6

The economic challenge for forest management is to make SFM a profitable activity that is attractive to investors and competitive with other land uses. A viable forest products industry is likely to be an essential element in addressing this challenge.

Indicator 7.1 Contribution of the forest sector to national economies	National level ✓✓	FMU level ✓	Landscape level ✓
<i>Proposed monitoring and reporting format</i>			
	<i>Total gross domestic product (GDP; USD)</i>		<i>% of forest-sector contribution to GDP</i>
Reference year <i>[please specify here]</i>			
Reference year minus five years <i>[please specify here]</i>			
Indicate which economic activities are counted under “forest sector”	<i>[Textual response]</i>		
Indicate the extent to which the informal forest sector contributes to GDP	<i>[Textual response]</i>		
Describe the national/subnational environmental accounting system in place (if any)	<i>[Textual response]</i>		

Indicator 7.2 Contribution of the forest sector to employment	National level ✓✓	FMU level ✓	Landscape level ✓
<i>Proposed monitoring and reporting format</i>			
	<i>Direct employment</i>		<i>Indirect employment</i>
Reference year <i>[please specify here]</i>			
Reference year minus five years <i>[please specify here]</i>			
Indicate the number of forestry jobs in the public sector			
Indicate the number of forestry jobs in the private sector			
Indicate the number of forestry jobs in civil-society organizations, including both national and international			

Indicator 7.3 Volume of wood production by product category	National level ✓✓	FMU level ✗	Landscape level ✗
Proposed monitoring and reporting format			
	<i>Markets (USD or local currency; if the latter, please indicate the exchange rate for USD)</i>		
	<i>Domestic market (rural/urban)</i>	<i>Export market</i>	<i>Informal domestic/ transboundary</i>
Timber products			
Woodfuel			
Non-wood forest products			
Other <i>[please specify]</i>			
Notes • Indicate reference year for data. • Values for timber products should be the sums of primary and secondary products (including wood furniture); indicate which products are included.			

Indicator 7.4 Volume of non-wood forest production	National level ✓✓	FMU level ✗	Landscape level ✗
Proposed monitoring and reporting format			
	<i>Markets (USD or local currency; if the latter, please indicate the exchange rate for USD)</i>		
	<i>Domestic market (rural/urban)</i>	<i>Export market</i>	<i>Informal domestic/ transboundary</i>
Non-wood forest products			
Water			
Carbon (USD or local currency— please specify— per tonne carbon dioxide)			
Ecotourism/recreation (entry fees, etc.)			
Other <i>[please specify]</i>			
Notes • Indicate reference year for data.			

Indicator 7.5 Value of forest products and environmental services	National level ✓✓	FMU level ✗	Landscape level ✗
Proposed monitoring and reporting format			
	<i>Markets (USD or local currency; if the latter, please indicate the exchange rate for USD)</i>		
	<i>Domestic market (rural/urban)</i>	<i>Export market</i>	<i>Informal domestic/transboundary</i>
Timber products			
Woodfuel			
Non-wood forest products			
Water			
Carbon (USD or local currency— please specify—per tonne carbon dioxide)			
Ecotourism/recreation (entry fees, etc.)			
Other [please specify]			
Notes • Indicate reference year for data. • Values for timber products should be the sums of primary and secondary products (including wood furniture); indicate which products are included.			

Indicator 7.6 Processing rate of wood and non-wood forest products	National level ✓✓	FMU level ✓✓	Landscape level ✓	
Proposed monitoring and reporting format				
Forest product processing stage	No. of companies	Industrial roundwood intake (m³)	Conversion rate (%)	No. of full-time equivalent employees (formal)
Roundwood (forest to mill)	n/a			n/a
Primary wood processing				
Secondary wood processing				
Tertiary wood processing		n/a	n/a	
Industrial non-wood forest product processing [please specify products]		n/a	n/a	
Continuity of supply of wood and non-wood products	[Textual response]			
Notes				
• Industrial roundwood intake includes roundwood from domestic production and imported roundwood processed in the country—it is the total volume of roundwood processed in mills (not the volume of harvested wood). • Conversion rate is the ratio of output volume to input volume, expressed as a percentage.				

Social and cultural aspects: indicators 7.7–7.14

SFM should recognize and aim to meet social and cultural needs as they relate to forests including by ensuring the provision of education, employment and safe working conditions. Forest management decisions should consider the livelihood needs of forest-dependent people. SFM should be participatory and inclusive, and the costs and benefits should be shared equitably among involved parties.

Indicator 7.7 Existence of procedures for assessing the social and environmental impacts of activities affecting forests	National level ✓✓	FMU level ✓	Landscape level ✓
<i>Proposed monitoring and reporting format</i>			
Describe the procedures in place in both the PFE and non-PFE to assess the social and environmental impacts of activities affecting forests			
Describe the extent to which forestry activities have an impact on the environment and human societies			
<i>Notes</i> • Trees and forests play fundamental roles in disaster risk management, such as by sustaining water supplies, protecting soils and reducing the impacts of natural hazards such as floods and landslides.			

Indicator 7.8 Implementation of environmental and social management plans	National level ✓✓	FMU level ✓	Landscape level ✓
<i>Proposed monitoring and reporting format</i>			
Describe the procedures in place in both the PFE and non-PFE for the implementation and monitoring of environmental and social management plans			
Describe the extent to which recommendations included in management plans are taken into account by forest managers to mitigate the impacts of work			
<i>Notes</i> • Trees and forests play fundamental roles in disaster risk management, such as by sustaining water supplies, protecting soils and reducing the impacts of natural hazards such as floods and landslides.			

Indicator 7.9 Capacity building of the workforce in forest management and forest industry	National level ✓✓	FMU level ✓	Landscape level ✓
Proposed monitoring and reporting format			
The number and main focus of universities, technical institutions, vocational training and other professional schools with formal programmes on SFM			
Existing capacity for training and support using appropriate technology, including through technology transfer, for SFM and the efficient use and marketing of wood and non-wood forest products and environmental services <i>[please describe and quantify]</i>			
Number of people graduated (tertiary, technical and vocational) from forest-related courses in the last three years <i>[please specify years]</i>			
Percentage of graduates (tertiary, technical and vocational) of forest-related courses in the previous three years obtaining employment in the forest sector <i>[please specify years]</i>			
Number of graduates from professional training programmes for forest managers, previous three years <i>[please specify years]</i>			
Other training courses not included above (e.g. capacity development programmes for small and medium-sized forest enterprises)			

Indicator 7.10 Procedures to ensure the health and safety of forest workers	National level ✓	FMU level ✓✓	Landscape level x
Proposed monitoring and reporting format			
<i>Existence and implementation of policies addressing:</i>	<i>National level (Yes/No)</i>		<i>FMU level (Yes/No)</i>
• Elimination or control of risks in forest management operations			
• Provision of safe work methods and procedures			
• Procedures for ensuring maximum safety of machinery and handling of chemicals, etc.			
• Use of safety gear and provision of workforce training on workplace health and safety			
• Proper compensation for employees in case of accidents, injuries and damage during the performance of duties			
What mechanisms are in place nationally/subnationally to ensure the health and safety of forest workers?	<i>[Textual response]</i>		
To what extent are such mechanisms being implemented? Please identify any constraints	<i>[Textual response]</i>		
Are such mechanisms in conformity with the International Labour Organization's Convention No. 169?	<i>[Yes/No]</i>		
<i>The number of serious accidents in forest management operations over the past three years, by cause:</i>	<i>No. of deaths</i>	<i>No. of serious injuries</i>	
Cause 1 <i>[please specify here]</i>			
Cause 2 <i>[please specify here]</i>			
Cause 3 <i>[please specify here]</i>			
Cause 4 <i>[please specify here]</i>			

Indicator 7.11 Mechanisms for the equitable sharing of the costs and benefits of forest management	National level X	FMU level ✓✓	Landscape level X
Proposed monitoring and reporting format			
Policies in place for:	Yes/No	Comments	
• The equitable treatment of stakeholders in activities related to the use and management of forests			
• Providing opportunities to be employed under comparable conditions to those in other economic sectors			
• The sharing of profits obtained by forest companies and investors through forest use with local communities and other stakeholders			
• Providing forest landowners or rights-holders (e.g. government, private, community) with opportunities to receive fair returns for forest use			
Mechanisms in place for the distribution of incentives and the fair and equitable sharing of costs and benefits among stakeholders [please comment on whether such mechanisms are being implemented, the obstacles to their implementation, and any proposed improvements]	[Textual response]		

Indicator 7.12 Mechanisms for resolving forest management-related disputes between forest stakeholders	National level ✗	FMU level ✓✓	Landscape level ✓✓
Proposed monitoring and reporting format			
<i>Matters that may be taken into account:</i>	Yes/No	Comments	
• The availability of effective mechanisms for communication and the resolution of conflicts between interested parties			
• The extent to which stakeholders have an effective voice in decisions related to forest management, including consideration of gender equity			
• Early consultation on major new decisions to invest in forest management, in both natural and planted forests			
• Mechanisms for conflict resolution, the extent to which they are being implemented, and any obstacles to implementation	[Textual response]		

Indicator 7.13 Livelihoods of Indigenous Peoples and local communities in PFE forests	National level x	FMU level ✓✓	Landscape level ✓✓
Proposed monitoring and reporting format			
Forest-dependent people (FMU level)	<i>No. female</i>	<i>No. male</i>	<i>Total</i>
Number of people in the FMU practising mainly subsistence farming			
Proportion of forest-dependent people who have lived in the FMU for more than one generation (%)			
Forest area for subsistence and traditional use:	<i>Forest area (ha)</i>	<i>Comments</i>	
• In informal areas within existing FMUs <i>[please specify land uses and measures for managing overlapping land uses]</i>			
• On land reserved for livelihood activities—e.g. Indigenous Peoples' reserves, community forests, other reserved areas <i>[please specify whether in or adjacent to FMUs]</i>			

Indicator 7.14 Forests reserved for specific cultural, research and educational purposes	National level ✓✓	FMU level x	Landscape level x
Proposed monitoring and reporting format			
<i>Extent of forest area assigned to specific uses</i>	<i>No. of forests</i>	<i>Area (ha)</i>	<i>Protection status</i>
Archaeological sites in the forests			
Cultural sites in forests			
Sacred forests (as defined in the country)			
Forests for recreation, local tourism and peri-urban uses			
Other <i>[please specify]</i>			

Local community and Indigenous Peoples' rights and participation in forest management: indicators 7.15–7.19

Community participation is vital at all levels of forest operations to ensure transparency and accountability in forest management, conservation and development and that all interests and concerns are taken into account. Forest agencies, forest owners and concessionaires must be willing and able to adapt their behaviour in light of such participation.

Indicator 7.15 Respect for user rights of Indigenous Peoples and local communities over PFE forests	National level ✓✓	FMU level ✓✓	Landscape level ✓✓
Proposed monitoring and reporting format			
	Area (ha)	Comments	
Area of publicly owned forest for which the tenure and user rights of Indigenous Peoples and other communities are recognized and practised			
Estimated area of PFE or FMU with recognized tenure and use rights for Indigenous Peoples and other local communities			
Procedures for resolving disputes over the forest-related rights of Indigenous Peoples and other local communities	[Textual response]		
Notes Describe any constraints and proposals for improvements.			

Indicator 7.16 Mechanisms for involving Indigenous Peoples and local communities in forest management	National level X	FMU level ✓✓	Landscape level ✓✓
Proposed monitoring and reporting format			
Indicate the extent of involvement of Indigenous Peoples, local communities and other forest dwellers in forest management capacity building, consultation processes, decision-making and implementation			
Describe the legislative and other efforts in place for achieving gender equity in forest management planning and implementation, in particular to enable the participation of indigenous and other local women			

Indicator 7.17 Area of forests managed by Indigenous Peoples and/or local communities for timber and non-timber production	National level X	FMU level ✓✓	Landscape level ✓✓
Proposed monitoring and reporting format			
Indicate the area of forests managed by communities and/or Indigenous Peoples for timber production			
Indicate the area of forests managed by communities and/or Indigenous Peoples for the production and harvesting of non-wood forest products			
Describe the efforts made by local people to prevent the endangerment or loss of harvested resources			

Indicator 7.18 Involvement of Indigenous Peoples and local communities in forest management	National level X	FMU level ✓✓	Landscape level ✓✓
Proposed monitoring and reporting format			
Indicate the extent to which Indigenous Peoples and local communities are involved in forest management planning and implementation and the constraints to greater integration			

Indicator 7.19 Recognition of the forest management knowledge and skills of local communities and Indigenous People	National level ✓	FMU level ✓✓	Landscape level X
Proposed monitoring and reporting format			
Indicate the extent to which indigenous and traditional forest-related knowledge and practices are integrated into forest management planning and implementation, and the constraints to greater integration			



Criterion 7: Economic, social and cultural aspects. Photo: MALEBI

Resources

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ITTO pioneered the development and use of criteria and indicators (C&I) to monitor, assess and report on tropical forests in the early 1990s, and the most recent version of the globally applicable ITTO C&I was published in 2016. African member countries, who benefited from an ITTO-funded regional C&I capacity-building programme conducted between 2000 and 2010, requested support to develop a set of C&I for Africa, focusing on lessons learned under that programme and the specific needs and characteristics of African forests. This publication is the result.



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