

Guidelines for the Development of a Criteria and Indicator Set for Sustainable Forest Management



Stefanie Linser, Peter O'Hara

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The work on this document was led by Stefanie Linser, who provided most of the expert knowledge and content on criteria and indicators for sustainable forest management. Peter O’Hara developed the “Toolbox of methods to assist in the development process of national criteria and indicators” (Annex 3). Valuable input and feedback was provided by national and international experts that have took part in the project so far. The project has been guided throughout by Roman Michalak and Theresa Loeffler of the UNECE and FAO Forestry and Timber Section.

The guidelines are available in English and have been translated into Russian by Vardan Melikyan.

Abbreviations

C	Criteria
C&I	Criteria and indicators
CBD	Convention on Biological Diversity
CFRQ	Collaborative Forest Resources Assessment
CMEF	EC Common Monitoring and Evaluation Framework for Rural Development Indicators
EEA	European Environment Agency
FAO	Food and Agriculture Organization of the United Nations
FMU	Forest Management Unit
FRA	FAO Forest resource assessment
GDP	Gross Domestic Product
IAEG	UN Inter-Agency Expert Group on SDG indicators
IAF	International Arrangement on Forests
ILO	International Labour Organisation
IPCC	Intergovernmental Panel on Climate Change
ITTO	International Tropical Timber Organization
IUCN	International Union for Conservation of Nature and Natural Resources
JFSQ	Joint Forest Sector Questionnaire (collects data on removals, production and trade of wood and wood products. Statistics are collected annually and the collection is co-ordinated by a number of international organisations: Eurostat, UNECE, FAO and ITTO)
JWEE	Joint Wood Energy Enquiry of the UNECE/FAO Forestry and Timber Section, Joint ECE/FAO Working Party on Forest Statistics, International Energy Agency (IEA), (FAO) and the European Commission (EC).
LFCC	Low Forest Cover Countries
MCPFE	Ministerial Conference on the Protection of Forests in Europe (FOREST EUROPE)
NFI	National forest inventory
OECD	Organization for Economic Co-operation and Development
PFE	Permanent forest estate
R&D	Research & Development
SDG	UN Sustainable Development Goal
SFM	Sustainable forest management
UNCCD	United Nations Convention to Combat Desertification
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
WS	Workshop

1 Introduction

1.1 Purpose of the guidelines

This document provides concepts, definitions, tools and reference materials to specifically help guide the development process of national Criteria and Indicator (C&I) sets for sustainable forest management (SFM) in the Caucasian and Central Asian countries of the UN Economic Commission for Europe (UNECE) and Food and Agriculture Organization of the UN (FAO) and UN Development Account (UNDA) project “Accountability Systems for Sustainable Forest Management in the Caucasus and Central Asia” 2016-2019. However, much of the guidance can also be relevant to C&I development processes elsewhere.

Criteria and indicators constitute an increasingly common policy tool for implementing sustainable forest management and facilitating clearly defining priorities and targets. This can improve monitoring, reporting and assessment of different key aspects of sustainable forest management performance.

1.2 Objectives of the project

The project, the UNECE/FAO, UNDA Project on Accountability Systems for Sustainable Forest Management in the Caucasus and Central Asia has the principal objective to strengthen the national capacity of the five countries (Armenia, Georgia, Kazakhstan, Kyrgyzstan and Uzbekistan) to identify appropriate C&I that are practicable, communicative, measurable, feasible and relevant to assess sustainable forest management in each country.

The process of the development of national criteria and indicator sets will combine the priorities and specific national needs of each country with international experience of existing regional and global sets. The project is expected to enable countries to actively participate in international processes related to forests, and contribute to the sustainable development of the sector towards a green economy.

1.3 Target audience of the guidelines

These guidelines are particularly relevant for the coordinating/facilitator teams responsible for national C&I set development as well as interested stakeholders engaged in the process of C&I development or who will implement or use C&I for SFM. These include policy makers, administrative bodies, forest owners, forest industry, NGOs, researchers, international organisations and the broad public alike are interested in knowing about the state of forests and forestry.

C&I related information on sustainable forest management can serve as a sound basis for their assessment and decision-making as well as a transfer of forest related knowledge.

1.4 Benefits and potentials of a national set of C&I for SFM

A national set of criteria and indicator for sustainable forest management can serve as a basis for evidence-based policy and communication.

It is beneficial for:

- monitoring, assessing and reporting on the state of a countries' forests
- strengthening the development of national forest programmes and monitoring their implementation
- providing incentives for sustainable forest management practices

- a dialogue between the forest and other sectors as well as with the society
- demonstrating forest contributions

1.5 Limitations of regional and national C&I sets

Despite the progress in implementing C&I over the last 25 years, some general shortcomings are evident:

- There is still no common agreed conceptual framework for C&I development which has caused variations in the quality of the process of C&I development. Recognising this deficit, the project and initiative will develop/test a national process/conceptual framework in a learning by doing – action research way.
- Developing them in an inclusive way through broad stakeholder engagement can be challenging and time consuming, seeking consensus or compromise between stakeholders with different interests in the forest sector.
- Sometimes C&I have become much more symbolic than practically used, not implemented as an institutionalised system and not fully integrated with existing forest information systems like forest resource assessments.
- Sometimes weak political will to support C&I implementation.
- Although improving for socio-economic indicators the data availability and quality are generally lower than for indicators concerned with forest resources, forest health or forest biodiversity.
- C&I sometimes do not consider linkages, interdependencies, and causal chains among indicators (Requardt, 2007), and do most often not connect/triangulate quantitative and qualitative indicators well.

1.6 Historical Background

Regional C&I for SFM processes were established at different times in the past, starting in 1991 after the United Nations Conference on Environment and Development. By 2000 there were 10 regional C&I for SFM processes ongoing with approximately 150 countries participating at various levels and ecosystems. Nowadays there are only eight more or less active C&I processes:

1. International Tropical Timber Organization, ITTO (1991-ongoing)
2. Pan-European Forest Process on Criteria and Indicators for Sustainable Forest Management, 1993-ongoing)
3. African Timber Organization, C&I for West Africa and C&I for Central Africa Process (1994-2016)
4. Montreal Process on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests (1995-ongoing)
5. Dry-Zone Africa Process on Criteria and Indicators for Sustainable Forest Management; with the support of FAO (1995-...)
6. Lepaterique Process of Central America on Criteria and Indicators for Sustainable Forest Management (1997-...)
7. Near East Process on Criteria and Indicators for Sustainable Forest Management; with the support of FAO (1996-ongoing)

8. Regional Initiative for the Development and Implementation of National-Level Criteria and Indicators for the Sustainable Management of Dry Forests in Asia; with the support of FAO (1999-ongoing)
9. The Tarapoto Proposal of Criteria and Indicators for Sustainability of the Amazon Forest (1995-ongoing).
10. The Low-Forest-Cover-Countries Process (LFCC) (2000-ongoing).

While some countries develop and implement criteria and indicators under one or even two processes, the degree of activity and/or involvement in the development and implementation of criteria and indicators may vary considerably between countries.

Also the processes differ in several attributes, such as forest type for which they were developed, level at which they are applied and by the number of criteria and indicators to address SFM. However, they all reflect a holistic approach to forests as ecosystems with multiple values beyond wood production (ITTO, 2012).

Some examples of regional indicator sets are presented in chapter 5 as food for thought and inspiration for the development of national C&I for SFM sets in the project countries.

2 The What? Basics for the development of C&I

2.1 Comprehension of Sustainable Forest Management

Widely used definitions:

Sustainable management means the stewardship and use of forests and forest lands in such a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems (MCPFE, 1993)

The United Nations describe SFM as: “[a] dynamic and evolving concept [that] aims to maintain and enhance the economic, social and environmental values of all types of forests, for the benefit of present and future generations” (FAO, www.fao.org/forestry/sfm/85084/en/).

The definitions make it clear that SFM will change over time but that its purpose is, at a minimum, to maintain all forest values in perpetuity. The following figure shows that SFM is a multidimensional concept because it incorporates the pillars of sustainable forest management: ecological sustainability, economic sustainability and socio-cultural sustainability which are based on longevity, social liability, efficient resource use and responsibility.

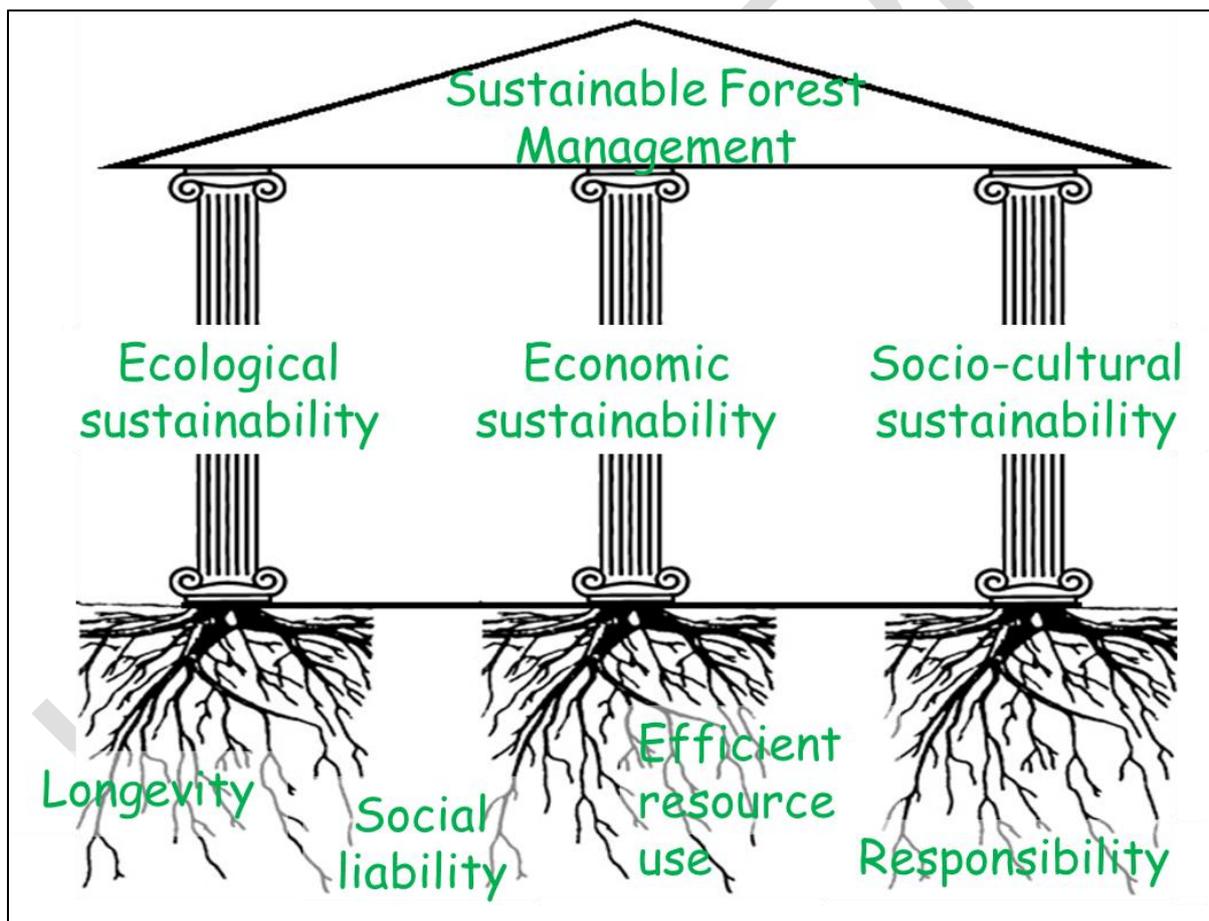


Figure 1: The three pillars of SFM. Source: Wolfslehner, 2007.

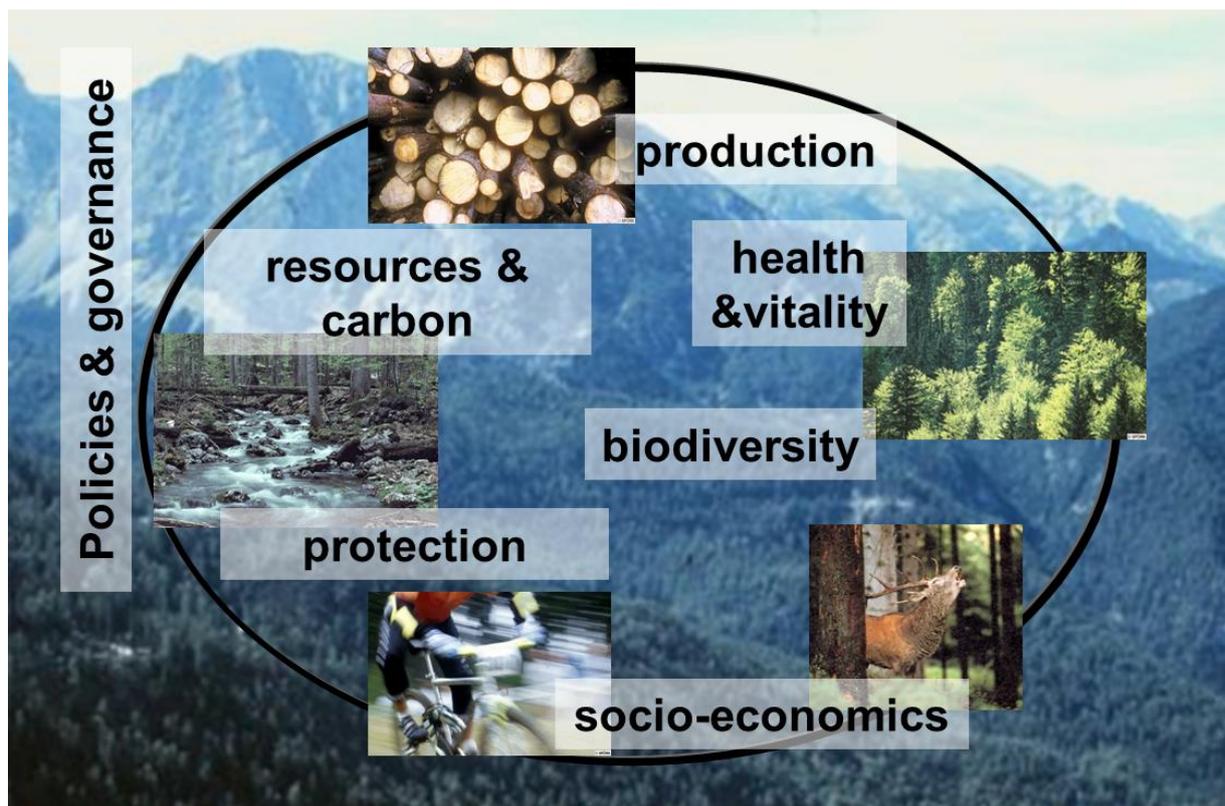


Figure 2: Essential elements of SFM. Source: Wolfslehner, 2007.

2.2 What are Criteria and Indicators (C&I)?

C&I can be applied at various levels: global, regional, national, subnational or at the Forest Management Unit (FMU) level, while allowing for differences within and between countries, regions or particular locations.

C&I provide a commonly agreed framework for articulating and defining expectations (including targets), developing managerial methods, best practice and performance elements of SFM and are then used in monitoring and evaluating progress towards those expectations and targets. In the past 25 years, national-level C&I have evolved mostly as reporting and monitoring instruments to nowadays increasingly being also used for assessment of the sustainability of forest management.

C&Is are also increasingly used to guide forest sector reforms, by identifying targets required to release the full potential of sustainable forest management. They have helped broaden the scope of forest sector reforms to include social, economic, governance as well as ecological aspects.

C&I can be at local forest management unit level, national, regional or international level. Criteria are generally becoming more aligned, but indicators' sets range from more generic at international and national level to more context-specific local level.

National C&Is should reflect a mix of technical aspects and stakeholder interests, they should take into consideration internationally agreed criteria, but with context derived specificity of indicators based on specific national characteristics and priorities for SFM.

C&Is originate from being part of a logical hierarchy process (see Figure 3 that follows) where higher level goals are divided into key principles of SFM which are in turn divided into criteria

each with a number of indicators. In the case of national C&I sets, the goal should be aligned with or derived from national visions or policy goals for SFM.

Although goals and principles are not commonly included in sets of C&I, using this hierarchy to structure the process of developing C&I has its merits. According to Hunter (1998) 'it is necessary to try to improve the hierarchical logical framework to increase the chance of including all relevant aspects of SFM in the set of C&I, for a number of reasons, to decrease the chance of including redundant indicators in the set, and to establish a clear and transparent logical relationship between the indicators to be measured and the principles to which it relates'.

In Annex 3, within the toolbox of methods to assist with the development of national C&I, there is a logical hierarchy process tool designed to help develop C&I in a coherent and logical way.

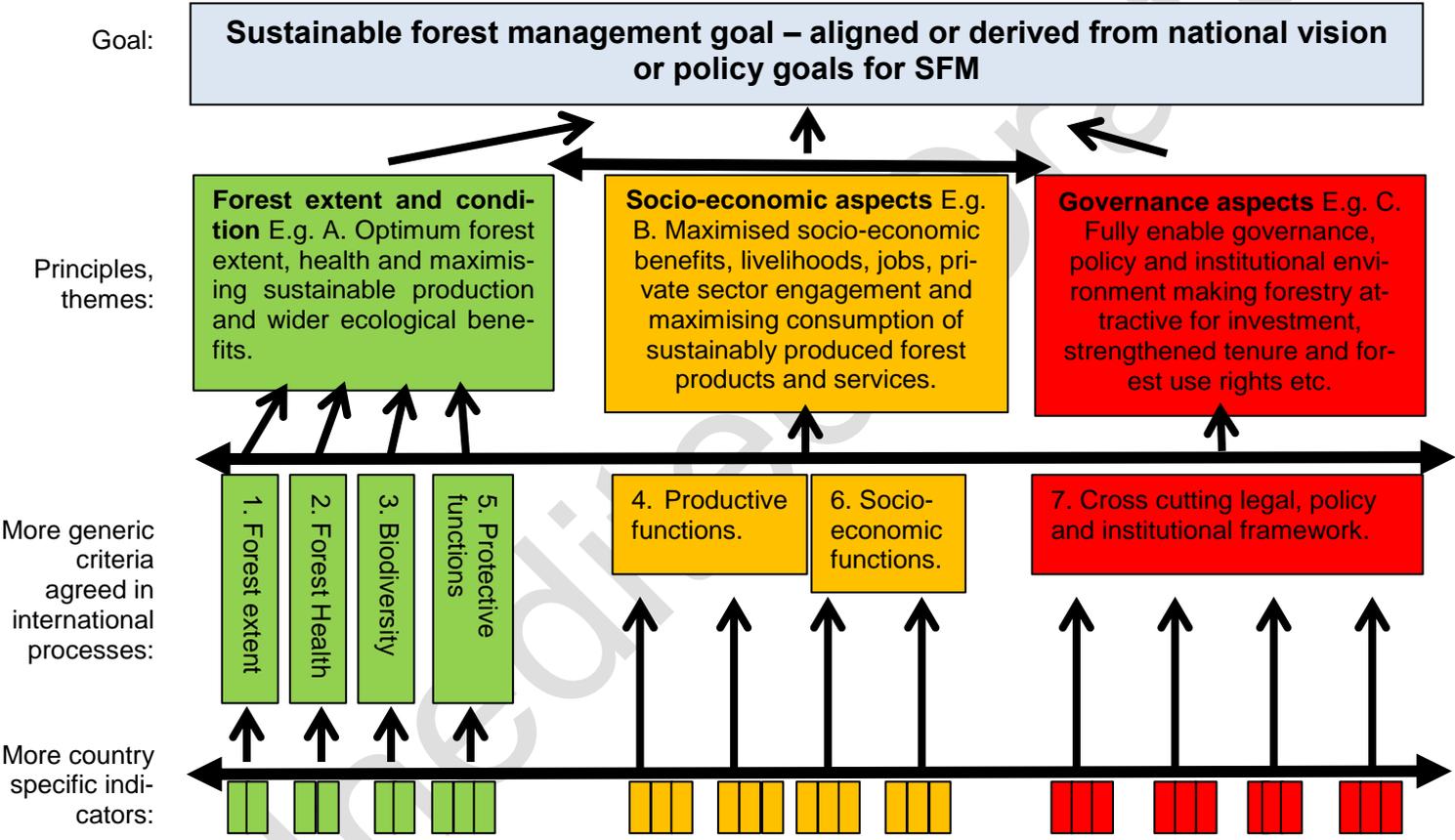


Figure 3. A summary of the hierarchical framework for the formulation of sustainable forest management standards (adapted to fit national C&I development of this project from Source: Tropenbos (Lammerts van Bueren and Blom, 1997, p. 26).

2.2.1 Criteria for SFM

Criteria relate to WHAT is important to measure.

Widely used definitions:

CRITERIA characterize or define the essential elements or set of conditions or processes by which sustainable forest management may be assessed (MCPFE, 1998).

CRITERIA define the essential elements against which sustainability is assessed, with due consideration paid to the productive, protective and social roles of forests and forest ecosystems. Each criterion relates to a key element of sustainability, and may be described by one or more indicators (FAO, 2015a).

A *CRITERION* is defined as an aspect of forest management that is considered important and by which SFM may be assessed. A criterion accompanied by a set of related indicators describes a state or situation that should be met to comply with SFM (ITTO, 2016).

Thus, a criterion is a condition that should be met to confirm that forests are managed sustainably. This could be e.g. maintenance, enhancement, protection or conservation of the essential elements of SFM.

2.2.1.1 Examples of criteria for SFM of various regional C&I processes

The six pan-European criteria for SFM (2015)

- C 1: Maintenance and appropriate enhancement of forest resources and their contribution to global carbon cycles
- C 2: Maintenance of forest ecosystem health and vitality
- C 3: Maintenance of productive functions of forests (wood and non-wood)
- C 4: Maintenance, conservation and appropriate enhancement of biological diversity in forest ecosystems
- C 5: Maintenance and appropriate enhancement of protective functions in forest management (notably soil and water)
- C 6: Maintenance of other socioeconomic functions and conditions

The seven criteria of the Montréal Process (2015)

- C 1: Conservation of biological diversity
- C 2: Maintenance of productive capacity of forest ecosystems
- C 3: Maintenance of forest ecosystem health and vitality
- C 4: Conservation and maintenance of soil and water resources
- C 5: Maintenance of forest contribution to global carbon cycles
- C 6: Maintenance and enhancement of long-term multiple socio- economic benefits to meet the needs of societies
- C 7: Legal, institutional and economic framework for forest conservation and sustainable management

The seven criteria of ITTO (2016)

- C 1: Enabling conditions for sustainable forest management
- C 2: Extent and condition of forests
- C 3: Forest ecosystem health and resilience
- C 4: Forest production
- C 5: Forest biological diversity

C 6: Soil and water protection

C 7: Economic, social and cultural aspects

The seven thematic elements of UNFF (2007)

Based on the above well-known and in many countries applied criteria for SFM, the United Nations Forum on Forests (UNFF) agreed in 2007 on *seven thematic elements of SFM*. These thematic elements are further used in this document to structure a shopping list of indicators (see Annex 1).

The seven thematic elements of SFM (UNFF, 2007):

1. Extent of forest resources
2. Forest biological diversity
3. Forest health and vitality
4. Productive functions of forest resources
5. Protective functions of forest resources
6. Socio-economic functions
7. Legal, policy and institutional framework.

2.2.2 Indicators for SFM

Indicators relate to HOW to measure SFM. They can be both quantitative and qualitative.

Widely used definitions:

INDICATORS show changes over time for each criterion and demonstrate the progress made towards their specific objectives (MCPFE, 1998).

INDICATORS are parameters which can be measured and correspond to a particular criterion. They measure and help monitor the status and changes of forests in quantitative, qualitative and descriptive terms that reflect forest values as seen by those who defined each criterion (FAO, 2015a).

SUSTAINABILITY INDICATORS are science-based measures that provide a consistent approach to assess, monitor and report progress on SFM to a wide range of stakeholders and institutions, including governments, the private sector, non-governmental organizations, donor organizations, researchers and the public. Sustainability indicators can be useful to identify the changes in forest management practices required to maintain and improve healthy forests (FAO, 2015b).

AN INDICATOR is a quantitative, qualitative or descriptive attribute that, when measured and monitored periodically, indicates the direction of change in a criterion. Indicators identify the information needed for assessing and monitoring change, both in the forest itself (outcome indicators) and as part of the environmental and forest management systems used (input and process indicators). A time series of the values of any measurable or clearly descriptive indicator can provide information on the direction of change, either towards or away from SFM. The indicators cannot by themselves establish the sustainability of management, however (ITTO, 2016).

Indicators are strong tools to collect and report information. Indicators can be based on different approaches:

- political
- scientific
- market-oriented

Indicators may have different purposes or uses:

- description and diagnosis
- communication
- forecasting and future trends
- collection of heterogeneous information and interests
- means of governance control
- check of effectiveness of policies and programmes

According to Ott (1978) ideally an index or an indicator is a *means devised to reduce a large quantity of data down to its simplest form retaining essential meaning for the question that are being asked of the data. In short, an index or indicator is designed to simplify.*

Thus, there is a graded information system (see also figure 4):

- Basic data: at the measurement place
- Processed information: statistically processed and harmonised data
- Indicator: **one or two-dimensional figure**, like forest area per inhabitant
- Index: **unit-less**, weighted, multi-dimensional aggregation, like the ecological footprint or the index of well-being.

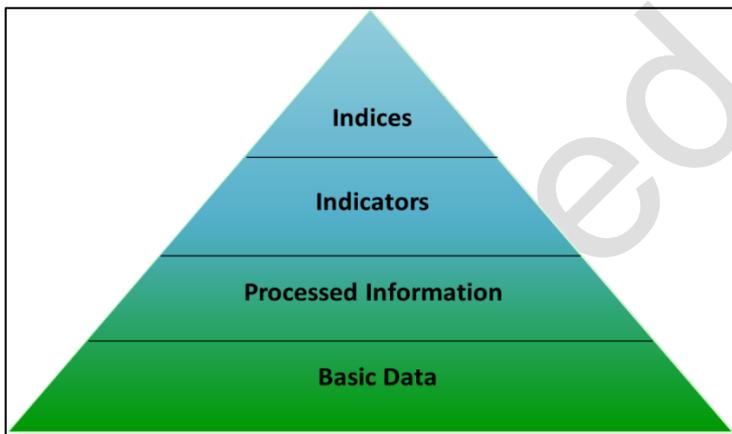


Figure 4: Data Pyramid. Source: Adrianse, 1995.

On the other hand, it should also be kept in mind and considered that indicators, respectively indicator sets, should have a format which is designed with an explicit user group in mind. Three types of user groups can be distinguished based on the quantity of information incorporated in the indicator set (see figure 4):

1. *Professional analysts and scientists.* They are most interested in raw, basic data which can be analysed statistically. They prefer many information bits per message conveyed but they also work with aggregated data. They prefer to draw their own conclusions based on the available data.
2. *Policy makers.* They prefer data which are related to policy objectives, criteria, targets, and threshold degrees. The information should be condensed to a few information bits per message not to lose clarity. Often they expect short multi-aspect analysis (pros and cons) to facilitate making a decision.
3. *The public.* This group is very diverse and assumed to prefer explicit, clear, and not too many messages in a single bit of information. In general, the public is overstrained to handle and

understand aggregated indicators. Usually, a simple one-side narrative (good or bad) accompanies this information.

Consequently, for each indicator set a format must be chosen which is attractive to and has meaning for the particular user group.

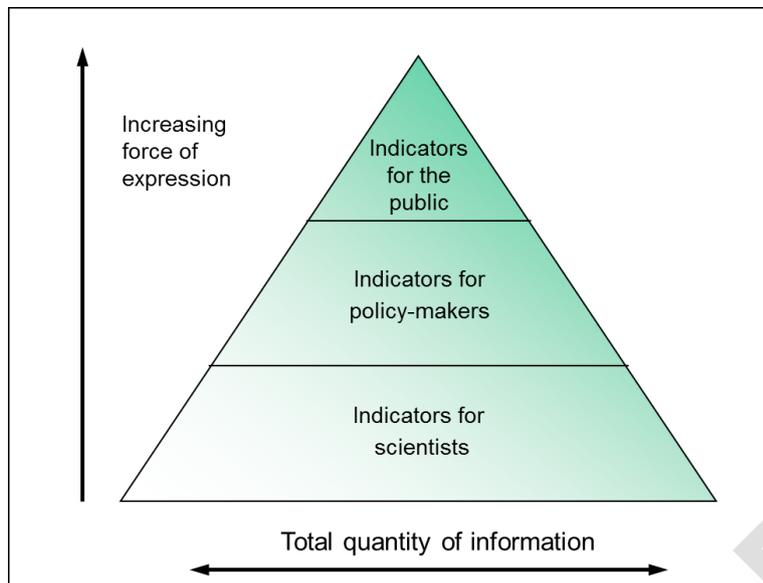


Figure 5: Relationship between indicators, data, force of expression and user groups (Linser, 2002).

2.2.2.1 Requirements for indicators

The requirements for SFM indicators comprise according to Linser (2002):

- The set of indicators should **display** the **expected use**.
- The set of indicators need to be **practicable**, that means a concise set of about 30 indicators, not hundreds of indicators.
- The indicators need to be **meaningful** and **communicative**, that means easily comprehensible, particularly for decision-makers.

If the above requirements are achieved, then there is also a need to comply with various requirements concerning the underlying data of SFM indicators:

- The data should be presented in time series if available, as this enables the evaluation of the **trend** of that aspect towards a sustainable management.
- The data should be **sensitive** with regard to human induced positive or negative changes.
- The data should have a **high validity** and **credibility**.
- The data should be **measurable** and **feasible**.
- Indicators should be **internationally comparable** and a reference for further action.

3 The Why? Demand for C&I for SFM in the Caucasus and Central Asia

Countries in Central Asia and the Caucasus face serious challenges that have hampered a proper reporting on the state of their forests. Data is often not available, measurements and collection of data are difficult and require capacity that is currently missing. Due to underestimated significance of forests and the forest sector, national policy and decision makers are not always aware of the importance of information for the effective implementation of sustainable forest management (SFM).

The five project countries range from 'low forest cover countries' (Kazakhstan, Kyrgyzstan, Uzbekistan) where forest and land degradation pose serious environmental challenges or countries with higher forest cover (Armenia, Georgia) where the forests potential to provide social, environmental and economic benefits is underutilized. The following issues have to be faced:

1. Challenges in national reporting: no forest inventories completed or recent reliable data available at national level;
2. No national criteria and indicators for sustainable forest management, or the current criteria and indicators are not up to date to respond the needs for monitoring progress towards sustainable development goals and green economy;
3. Illegal logging, forest degradation, land degradation and excessive grazing pose threat to the forests in the countries in the region, but tools to collect reliable information are not available, and the importance of monitoring not acknowledged;
4. Importance of the environmental, economic and social aspects of the forest sector is underestimated by the policymakers due to the lack of information and tools to communicate (such as criteria and indicators);
5. Countries do not actively participate in international criteria and indicators processes (except Georgia). Therefore, they cannot benefit directly from the knowledge and tools developed by these processes;
6. Serious challenges in international reporting: no data or incomplete data provided to international reporting processes.

The project countries participate poorly in international forest reporting processes due to limited national reporting capacities. Proper monitoring tools such as national criteria and indicators do not exist in most project countries, even though international SFM C&I systems have been established over 25 years ago. The target countries struggle for resources with other large sectors such as agriculture, and concrete support is needed to make the forest sector visible to facilitate the relevant policy support and legislative development.

4 The How? Development of national C&I for SFM

4.1 Stakeholder engagement

Many sectors and different stakeholders have interests in forests. There is a wide range of actors with a broad interest in analysing, defining, negotiating and agreeing on appropriate national C&I including rural people who use forest resources, governments, administrative bodies, the private sector, non-governmental organizations, international organizations, researchers etc.

It is essential to conduct a stakeholder mapping exercise to establish the most relevant stakeholders to engage in the process. A tool to conduct the stakeholder mapping is described in Annex 3.

A participatory C&I for SFM development process can help to ensure that all stakeholder priorities on forests and forestry are considered in the resulting set of national C&I for SFM. A set of tools designed to provide options for stakeholder engagement in analysis, defining, negotiating and prioritising national C&I are described in Annex 3.

This kind of multi-stakeholder processes help to generate mutual ownership of the end-products, build up an atmosphere of trust between the various forestry stakeholder groups and the results serve as a basis for agreements, the evaluation of results, transparency and accountability. In general, national C&I sets that have been developed with a participatory approach are more relevant to national characteristics as stakeholders priorities are considered and enhances ownership and awareness of C&I among the range of stakeholders leading to more support the implementation.

The results of this project should be the basis for subsequent participative elaborated revisions and adaptations due to national and international changing conditions, emerging issues and new requirements.

4.2 The process of developing a nationally derived set of Criteria and Indicators

There is no commonly agreed conceptual framework on how national C&I should be developed.

The focus should be to identify the smallest number of C&I needed to comprehensively and reliably monitor, report and assess forest management in a cost-effective manner.

An example of a C&I development approach is provided by the following steps for indicator selection (acc. Linser, 2002, adapted, see Figure 6):

1. Training the team to coordinate/facilitate the process of national C&I development on principles, process, methods and skills (This manual is designed to guide this training).
2. Review of existing relevant national forest information and forest information systems.
3. Review of relevant regional and international C&I processes and sets.
4. Stakeholder mapping to identify relevant stakeholders to engage in the process (See appropriate tool in Annex 3)
5. Facilitating stakeholder engagement, analysis, multi-stakeholder negotiation and prioritisation of the key priority areas for national level C&I to focus on.
6. Conducting a logical hierarchy process from national goals down to criteria and indicators. Drawing upon and adapting indicators relevant to national priorities from regional and national C&I sets (cf. Annex 1: Shopping List of Indicators) and developing new indicators where gaps exist

7. Evaluation of the potential indicators with regard to the requirements mentioned in chapter 2.2.2.1.
8. Examination of existing national data collection systems for appropriate data to support the construction of the candidate indicators. If the desired data is not available, feasibility of collection of such data should be examined, and if the answer is positive a new impulse for data acquisition should be given.
9. Selection of indicators.

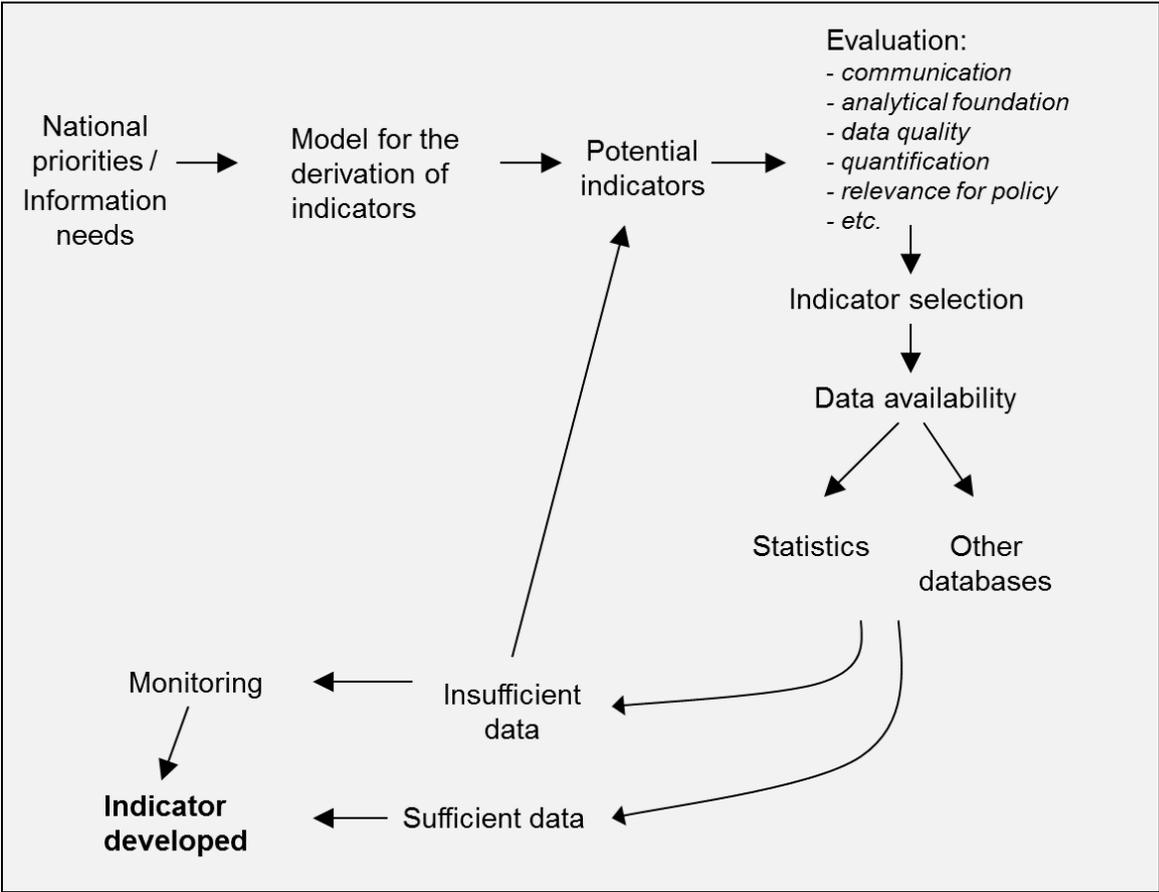


Figure 6: Process of national C&I indicator development, steps 6 to 9 of the above listed process steps (Linser, 2002, adapted).

However, in practise the national C&I process could be more complex and include a mix between a bottom-up and a top-down approach with the process and outcomes, particularly indicators built strongly on national characteristics and priorities but with an aim for alignment of particularly criteria with regional and international C&I sets. The process should be logical, clear, transparent, as inclusive as possible and combining technical aspects with stakeholder interests. A proposed and during this project applied conceptual framework for developing national C&I is displayed in figure 7.

This conceptual framework builds on three sources to logically develop a coherent and clear hierarchy of national priorities, criteria and indicators which are nationally relevant, compatible with international systems, user friendly and feasible to implement. The three major inputs derive from reviewing existing national forest information systems and relevant past national experience bottom-up stakeholder engagement to define national priorities and top-down reference to regional-

ly/intentionally used C&I sets. The three inputs illustrated in figure 7 do not necessarily follow a sequence, but can go in parallel.

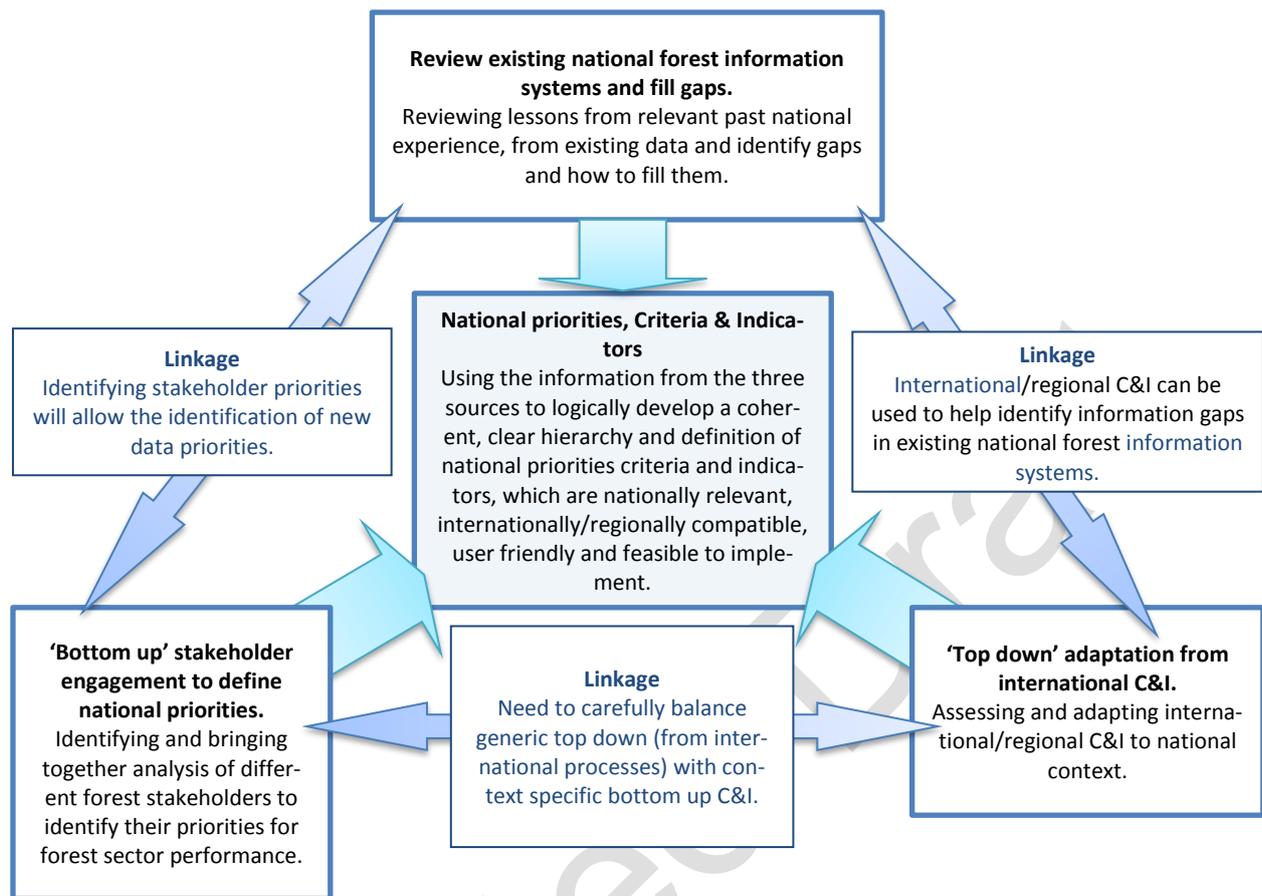


Figure 7: Conceptual Framework for C&I development. Source: O'Hara, 2017.

4.3 Structure of the indicator fact sheet

Each indicator should be structured according to the following headings which are shortly described below:

Qualitative/descriptive indicators (variables, which can only be described). They are especially about the overall policies, institutions and instruments for sustainable forest management in place):

- Indicator
- Rationale
- Descriptive questions
- Related definitions

Quantitative indicators (variables which can be measured and which are usually presented with a number):

- Indicator
- Rationale
- International data source
- Measurement units
- Current periodicity of data availability
- Reporting notes
- Related definitions

Indicator

The name of the indicator represents the brief reference to the full text of the indicator.

The full text of the indicators should not make reference to “change”. However, change which is derived from the comparison of data from two different points in time should always be taken into account. Change is usually to be understood as "average change per year".

Rationale

This paragraph explains the rationale behind the indicator, its scope and limitations. It may also include the explanation of the desired direction of change, the utility of the information provided through the indicator, the range of views expressed, possible threshold issues and pitfalls in interpretation and limitations in force of expression, as well as major links to other indicators or criteria.

Data sources

In this paragraph the relevant main national and international data sources and providers are listed. The ultimate source of data should be the national level (national statistics, national inventories and other national data providers).

Measurement units

This paragraph provides the measurement units of the indicator for the status as well as for changes. If possible an error estimate should also be included.

Current periodicity of data availability

This paragraph shows the current periodicity of data availability. However, the information provided under this heading must be understood in a general approach since the description of the periodicity should take into account various situations.

The periodicity of reporting may differ between different figures or parameters within an indicator. Some of the information is usually associated with periodic cycles of the national forest inventories (NFI), however countries with continuous NFI are capable of providing annual estimates.

Reporting notes

The reporting notes refer to classification categories as well as to instructions on how to collect the respective data which are not obvious from the wording of the full text of the indicator.

Targets and/or thresholds

Targets refer to agreed national or international targets which should be reached within a certain period of time; they can be expressed either as absolute values or expected direction of trends. Thresholds refer to scientific and/or official thresholds which should not be exceeded, e.g. regarding certain emissions.

Related definitions

The underlying terms and definitions related to the indicator should be listed in a glossary. As examples please see the glossary in the FAO FRA 2015, <http://www.fao.org/docrep/017/ap862e/ap862e00.pdf> or the FOREST EUROPE glossary, <http://foresteurope.org/communication/#1473684927281-829b95cc-499686b5-6c62>.

4.3.1 Examples for indicator fact sheets:

Structure for **qualitative** indicators:

Criterion:	
Number of Indicator	Name of the indicator:
Rationale:	
Descriptive questions:	
Related definitions:	

Example of a qualitative (descriptive) indicator from FOREST EUROPE:

CRITERION 4: MAINTENANCE, CONSERVATION AND APPROPRIATE ENHANCEMENT OF BIOLOGICAL DIVERSITY IN FOREST ECOSYSTEMS	
Indicator C4.	Name of the indicator: Policies, institutions and instruments to maintain, conserve and appropriate enhance the biological diversity in forest ecosystems
Rationale:	
<p>The policy dialog related to the maintenance, conservation and appropriate enhancement of the biological diversity in forest ecosystem, is basic to implement and achieve the sustainable management of the forests and the forest sector.</p> <p>Forest management policies and practices in Europe promote biodiversity, notably through the use of natural regeneration and mixed-species stands, encouraging higher proportion of deadwood in forests, enhancing biological diversity in forest ecosystems, managing genetic resources, single stands and the landscape, etc. Information on policies, objectives, actions and measures taken related to forest biodiversity, is key for establishing a dialogue on forests, analyse the efficiency and effectiveness of the current policies and identifying gaps and updating needs to substantially contribute to forest biodiversity conservation and management at pan European level.</p> <p>Policy framework, legislation/regulations, institutional capacity, economic and financial instruments and informative means, with associated policy actions/measures on biological diversity, trees species, regeneration, naturalness, introduced tree species, deadwood, genetic resources, threatened forest species, protected forests, including as appropriate considerations on policies and measures/actions taken on forest fragmentation/landscape pattern, etc., both at national and sub-national levels, create an enabling environment for the sustainable management of the forests and the forest sector.</p>	
Descriptive questions:	
<p>Information, where appropriate, on main policy objectives, relevant institutions, main policy instruments (legal/regulatory, financial/economic, informational) and significant changes related to the maintenance, conservation and appropriate enhancement of the biological diversity in forest ecosystem.</p> <ul style="list-style-type: none"> • Existence of forest policies and instruments, including specific policy objectives, related to the maintenance, conservation and appropriate enhancement of the biological diversity in forest ecosystem. • Existence and capacity of an institutional framework to maintain, conserve and appropriately enhance biological diversity at the forest ecosystems, manage species and genetic levels; have responsibilities related to protected areas, protect threatened species, ensure regeneration of managed forests, etc. • Existence of a legal/regulatory framework for the management, conservation and sustainable 	

development of forest; that provides national adherence to international legal instruments; provides legal instruments to protect representative, rare or vulnerable forest ecosystems, to protect threatened species; to ensure regeneration of managed forests, etc.

- Existence of economic and financial instruments to maintain, conserve and appropriately enhance biological diversity at the forest ecosystems.
- Existence of informational means to implement the policy framework.
- Related actions and measures taken to maintain, conserve and appropriate enhance the biological diversity in forest ecosystems, including considerations to forest fragmentation.

Related definitions:

Biological diversity; Conservation of biodiversity; Forest policy; Protected forest; Policies supporting sustainable forest management; Institutional framework

Structure for **quantitative** indicators:

Criterion:	
Number of Indicator	Name of the indicator: Full text:
Rationale:	
Data sources:	
Measurement units:	
Current periodicity of data availability:	
Reporting notes:	
Targets and/or thresholds:	
Related definitions:	

Example of a quantitative indicator from FOREST EUROPE (modified with threshold information from the SEMAFOR project (System for the Evaluation of the Management of Forests, <https://www.unece.org/fileadmin/DAM/timber/meetings/20160323/Wed/2016-jwpcfsem-item5-1-3-semafor.pdf>))

CRITERION 1: MAINTENANCE AND APPROPRIATE ENHANCEMENT OF FOREST RESOURCES AND THEIR CONTRIBUTION TO GLOBAL CARBON CYCLES	
Indicator 3.1	<p>Increment and fellings</p> <p>Full text: Balance between net annual increment and annual fellings of wood on forest available for wood supply</p>
<p>Rationale:</p> <p>This indicator highlights the sustainability of timber production over time as well as the current availability and the potential for future availability of timber. For a long run sustainability the annual fellings must not exceed the net annual increment.</p> <p>The net annual increment is defined according to FRA 2015 as “average annual volume of gross increment over the given reference period less that of natural losses on all trees, measured to minimum diameters as defined for growing stock”. Gross increment includes the volume growth of survivor trees and the increment on trees which have been felled or die during the reference period.</p> <p>This indicator is mainly linked to indicators 2.1, 2.3 and 2.4.</p>	
<p>Data sources:</p> <ul style="list-style-type: none"> - FOREST EUROPE/UNECE/FAO (for fellings) - Eurostat: JQ annual data (for removals) 	
<p>Measurement units:</p> <p>Status: m³</p> <p>Changes: m³/yr</p>	
<p>Current periodicity of data availability:</p> <p>Usually associated with NFI, typically 10 years.</p>	
<p>Reporting notes:</p> <p><i>Separate figures to be reported on:</i></p> <ul style="list-style-type: none"> - Net annual increment of wood on forest available for wood supply - Annual fellings of wood on forest available for wood supply - Net annual increment of wood on total forest area - Annual fellings of wood on total forest area 	
<p>Targets and/or thresholds:</p> <p>Threshold: Ratio fellings/net annual increment on forest available for wood supply, in most recent ten-year period exceeds 100%.</p>	
<p>Related definitions:</p> <p>Forest, Forest available for wood supply, Growing stock, Gross annual increment, Net annual increment, Natural losses, Fellings.</p>	

5 Examples of regional C&I sets

The criteria and indicators listed in the following regional C&I sets should give food for thought and inspiration for the national elaboration of adequate criteria and indicators. However, due to special national characteristics and country specific priorities also other criteria and indicators might be appropriate for the national set. There is no need to orientate strictly on the set of one certain process.

5.1 The FOREST EUROPE C&I

The pan-European set of C&I for SFM of the FOREST EUROPE Process (2015) contains 6 criteria and 45 indicators. The first five indicators are not assigned to a particular criterion but address the overarching policy framework of the set and are of qualitative/descriptive nature.

	No.	Indicator
Forest policy and governance	1	National Forest Programmes or equivalent
	2	Institutional frameworks
	3	Legal/regulatory framework: National (and/or sub-national) and International commitments
	4	Financial and economic instruments
	5	Information and communication

Criteria	No.	Indicator	Full text
Criterion 1: Maintenance and Appropriate Enhancement of Forest Resources and their Contribution to Global Carbon Cycles	C.1	Policies, institutions and instruments to maintain and appropriately enhance forest resources and their contribution to global carbon cycles	
	1.1	Forest area	Area of forest and other wooded land, classified by forest type and by availability for wood supply, and share of forest and other wooded land in total land area
	1.2	Growing stock	Growing stock on forest and other wooded land, classified by forest type and by availability for wood supply
	1.3	Age structure and/or diameter distribution	Age structure and/or diameter distribution of forest and other wooded land, classified by availability for wood supply
	1.4	Forest carbon	Carbon stock and carbon stock changes in forest biomass, forest soils and in harvested wood products

Criteria	No.	Indicator	Full text
Criterion 2: Maintenance of Forest Ecosystem Health and Vitality	C.2	Policies, institutions and instruments to maintain forest ecosystem health and vitality	
	2.1	Deposition and concentration of air pollutants	Deposition and concentration of air pollutants on forest and other wooded land
	2.2	Soil condition	Chemical soil properties (pH, CEC, C/N, organic C, base saturation) on forest and other wooded land related to soil acidity and eutrophication, classified by main soil types
	2.3	Defoliation	Defoliation of one or more main tree species on forest and other wooded land in each of the defoliation classes
	2.4	Forest damage	Forest and other wooded land with damage, classified by primary damaging agent (abiotic, biotic and human induced)
	2.5	Forest land degradation	Trends in forest land degradation
Criterion 3: Maintenance and Encouragement of Productive Functions of Forests (Wood and Non-Wood)	C.3	Policies, institutions and instruments to maintain and encourage the productive functions of forests	
	3.1	Increment and fellings	Balance between net annual increment and annual fellings of wood on forest available for wood supply
	3.2	Roundwood	Quantity and market value of roundwood
	3.3	Non-wood goods	Quantity and market value of non-wood goods from forest and other wooded land
	3.4	Services	Value of marketed services on forest and other wooded land
Criterion 4: Maintenance, Conservation and Appropriate Enhancement of Biological Diversity in Forest Ecosystems	C.4	Policies, institutions and instruments to maintain, conserve and appropriately enhance the biological diversity in forest ecosystem	
	4.1	Diversity of tree species	Area of forest and other wooded land, classified by number of tree species occurring
	4.2	Regeneration	Total forest area by stand origin and area of annual forest regeneration and expansion
	4.3	Naturalness	Area of forest and other wooded land by class of naturalness
	4.4	Introduced tree species	Area of forest and other wooded land dominated by introduced tree species
	4.5	Deadwood	Volume of standing deadwood and of lying deadwood on forest and other wooded land
	4.6	Genetic resources	Area managed for conservation and utilisation of forest tree genetic resources (in situ and ex situ genetic conservation) and area managed for seed production
	4.7	Forest fragmentation	Area of continuous forest and of patches of forest separated by non-forest lands

Criteria	No.	Indicator	Full text
	4.8	Threatened forest species	Number of threatened forest species, classified according to IUCN Red List categories in relation to total number of forest species
	4.9	Protected forests	Area of forest and other wooded land protected to conserve biodiversity, landscapes and specific natural elements, according to MCPFE categories
	4.10	Common forest bird species	Occurrence of common breeding bird species related to forest ecosystems
Criterion 5: Maintenance and Appropriate Enhancement of Protective Functions in Forest Managem.	C.5	Policies, institutions and instruments to maintain and appropriately enhance of the protective functions in forest management	
	5.1	Protective forests – soil, water and other ecosystem functions - infrastructure and managed natural resources	Area of forest and other wooded land designated to prevent soil erosion, preserve water resources, maintain other protective functions, protect infrastructure and managed natural resources against natural hazards
Criterion 6: Maintenance of other socioeconomic functions and conditions	C.6	Policies, institutions and instruments to maintain other socioeconomic functions and conditions	
	6.1	Forest holdings	Number of forest holdings, classified by ownership categories and size classes
	6.2	Contribution of forest sector to GDP	Contribution of forestry and manufacturing of wood and paper products to gross domestic product
	6.3	Net revenue	Net revenue of forest enterprises
	6.4	Investments in forests and forestry	Total public and private investments in forests and forestry
	6.5	Forest sector workforce	Number of persons employed and labour input in the forest sector, classified by gender and age group, education and job characteristics
	6.6	Occupational safety and health	Frequency of occupational accidents and occupational diseases in forestry
	6.7	Wood consumption	Consumption per head of wood and products derived from wood
	6.8	Trade in wood	Imports and exports of wood and products derived from wood
	6.9	Wood energy	Share of wood energy in total primary energy supply, classified by origin of wood
	6.10	Recreation in forests	The use of forests and other wooded land for recreation in terms of right of access, provision of facilities and intensity of use
Σ = 34 quantitative indicators + 11 qualitative indicators (total 45 indicators)			

5.2 The Montréal Process C&I

The Montréal Process set of C&I for the Conservation and Sustainable Management of Temperate and Boreal Forests (2015) contains 7 criteria and 54 indicators (https://www.montrealprocess.org/Resources/Criteria_and_Indicators/index.shtml).

Unedited Draft

Criterion 1: Conservation of Biological Diversity

1.1. Ecosystem Diversity

- 1.1.a Area and percent of forest by forest ecosystem type, successional stage, age class, and forest ownership or tenure
- 1.1.b Area and percent of forest in protected areas by forest ecosystem type, and by age class or successional stage
- 1.1.c Fragmentation of forests

1.2. Species Diversity

- 1.2.a Number of native forest-associated species
- 1.2.b Number and status of native forest-associated species at risk, as determined by legislation or scientific assessment
- 1.2.c Status of on site and off site efforts focused on conservation of species diversity

1.3. Genetic Diversity

- 1.3.a Number and geographic distribution of forest-associated species at risk of losing genetic variation and locally adapted genotypes
- 1.3.b Population levels of selected representative forest-associated species to describe genetic diversity
- 1.3.c Status of on site and off site efforts focused on conservation of genetic diversity

Criterion 2: Maintenance of Productive Capacity of Forest Ecosystems

- 2.a Area and percent of forest land and net area of forest land available for wood production
- 2.b Total growing stock and annual

- increment of both merchantable and non-merchantable tree species in forests available for wood production
- 2.c Area, percent, and growing stock of plantations of native and exotic species
- 2.d Annual harvest of wood products by volume and as a percentage of net growth or sustained yield
- 2.e Annual harvest of non-wood forest products

Criterion 3: Maintenance of Forest Ecosystem Health and Vitality

- 3.a Area and percent of forests affected by biotic processes and agents (e.g., disease, insects, invasive alien species) beyond reference conditions.
- 3.b Area and percent of forest affected by abiotic agents (e.g., fire, storm, land clearance) beyond reference conditions

Criterion 4: Conservation and Maintenance of Soil and Water Resources

4.1. Protective Function

- 4.1.a Area and percent of forest whose designation or land management focus is the protection of soil or water resources

4.2. Soil

- 4.2.a Proportion of forest management activities that meet best management practices or other relevant legislation to protect soil resources
- 4.2.b Area and percent of forest land with significant soil degradation

4.3. Water

- 4.3.a Proportion of forest management activities that meet best management practices, or other relevant legislation, to protect water related resources
- 4.3.b Area and percent of water bodies, or stream length, in forest areas with significant change in physical, chemical, or biological properties from reference conditions

Criterion 5: Maintenance of Forest Contribution to Global Carbon Cycles

- 5.a Total forest ecosystem carbon pools and fluxes
- 5.b Total forest product carbon pools and fluxes
- 5.c Avoided fossil fuel carbon emissions by using forest biomass for energy

Criterion 6: Maintenance and Enhancement of Long-term Multiple Socio-economic Benefits

6.1. Production and Consumption

- 6.1.a Value and volume of wood and wood products production, including primary and secondary processing
- 6.1.b Value of non-wood forest products produced or collected
- 6.1.c Revenue from forest based ecosystem services
- 6.1.d Total and per capita consumption of wood and wood products in round wood equivalents
- 6.1.e Total and per capita consumption of non-wood forest products
- 6.1.f Value and volume in round wood equivalents of exports and

- imports of wood products
- 6.1.g Value of exports and imports of non-wood forest products
- 6.1.h Exports as a share of wood and wood products production, and imports as a share of wood and wood products consumption
- 6.1.i Recovery or recycling of forest products as a percent of total forest products consumption

6.2. Investment in the Forest Sector

- 6.2.a Value of capital investment and annual expenditure in forest management, wood and non-wood forest product industries, forest-based environmental services, recreation, and tourism
- 6.2.b Annual investment and expenditure in forest-related research, extension and development, and education

6.3. Employment and Community Needs

- 6.3.a Employment in the forest sector
- 6.3.b Average wage rates, annual average income and annual injury rates in major forest employment categories
- 6.3.c Resilience of forest-dependent communities
- 6.3.d Area and percent of forests used for subsistence purposes
- 6.3.e Distribution of revenues derived from forest management

6.4. Recreation and Tourism

- 6.4.a Area and percent of forests available and/or managed for public recreation and tourism
- 6.4.b Number, type, and geographic distribution of visits attributed to

- recreation and tourism and related to facilities available

6.5. Cultural, Social, and Spiritual Needs and Values

- 6.5.a Area and percent of forests managed primarily to protect the range of cultural, social, and spiritual needs and values
- 6.5.b The importance of forests to people

Criterion 7: Legal, Institutional, and Economic Framework for Forest Conservation and Sustainable Management

- 7.1.a Legislation and policies supporting the sustainable management of forests
- 7.1.b Cross sectoral policy and programme coordination
- 7.2.a Taxation and other economic strategies that affect sustainable management of forests
- 7.3.a Clarity and security of land and resource tenure and property rights
- 7.3.b Enforcement of laws related to forests
- 7.4.a Programmes, services and other resources supporting the sustainable management of forests
- 7.4.b Development and application of research and technologies for the sustainable management of forests
- 7.5.a Partnerships to promote the sustainable management of forests
- 7.5.b Public participation and conflict resolution in forest-related decision making
- 7.5.c Monitoring, assessment, and reporting on progress towards sustainable management of forests

5.3 C&I for SFM in Low-Forest-Cover-Countries (LFCC)

The recommended set of LFCC C&I for SFM (Jafari, 2011) contains 7 criteria and 93 indicators.

Criteria	Elements	Indicators
Criterion 1: Biological Diversity	Element 1-1: Ecosystem Diversity	1-1-1- Forest area, age class in ecozone
		1-1-2- Forest area, age class all types of soil and protected zone from geomorphology point of view
		1-1-3- Forest type fragmentation
		1-1-4- Forest ecosystem degradation
		1-1-5- Area of protected forest ecosystem
	Element 1-2: Species Diversity	1-2-1- Endanger species in forest
		1-2-2- Population of species in a selected forest
		1-2-3- Species distributions
		1-2-4- Endemic and invader species
		1-2-5- Suitable habitat for wildlife with economic value
		1-2-6- Natural regeneration of species
	Element 1-3: Genetic Diversity	1-3-1- Genetic diversity in seed reforestation
		1-3-2- <i>in situ</i> and <i>ex situ</i> conservation of endanger species and species with economical value in each ecozone
		1-3-3- Population of main and key species
Criterion 2: Ecosystem condition and its Production		2-1- (Forest production), total tree growth, economical and non trade value trees
		2-2- Increase or decrease of forest area, with the reason
		2-3- Forest area damaged by: forest fire, insects, pests, disease, wood harvesting (forest health and vigor)
		2-4- Forest area damaged by: drought, acid wash and ozone impact
		2-5- Forest area which regenerate successfully after harvesting
		2-6- Mean annual increments (growth) based upon forest type and age class
		2-7- Percentage of crown cover
		2-8- Percentage of biomass as volume (general type of forest)
		2-9- Forest protected zones
		2-10- Forestry project and percentage of coverage areas
		2-11- Forestry research project
		2-12- Rehabilitation of arid and semi-arid zone
		2-13- Afforestation
		2-14- Forest parks
Criterion 3: Soil and Water		3-1- Local acceptance (follow up) of standard law in related to the soil erosion
		3-2- Local acceptance of soil erosion in related to the road construction and river
		3-3- Area of watershed which are damaged (degraded) because of land use change in last 20 years
		3-4- Water level in forest zone

Criterion 4: Forest Role in Global Ecologic Cycle	Element 4-1: Carbon Cycle	4-1-1- Changes of net carbon in forest ecosystem	
		4-1-2- Carbon storage in forest ecosystems, according to forest type and age class	
		4-1-3- Net change in forest Carbon production	
		4-1-4- Carbon emission in forest sector	
		4-1-5- Net Carbon destruction	
	Element 4-2: Climate Change	4-2-1- Partnership in Climate Change Convention and other related issue in forest sector	
Criterion 5: Social and Economic benefits	Element 5-1: Economic benefits	5-1-1- Share of wood production in GDP	
		5-1-2- Value of secondary products from harvested wood product	
		5-1-3- Production, Consumption, Import and export of wood products	
		5-1-4- Share of non wood products in GDP	
		5-1-5- Value of non wood products (non trading)	
		5-1-6- Production, Consumption, Import and export of non wood products	
		5-1-7- Share of forest related services in GDP	
		5-1-8- Value of forest related services (non trading)	
		5-1-9- Percentage of energy usage of renewable forest resources, compare to total energy use	
		5-1-10- Investment volume in forest growth, health, management, planted forest, wood processing and tourism	
	Element 5-2: Benefit sharing	5-2-1- Forest areas and time of wood production	
		5-2-2- Distribution of financial benefits of industries wood productions	
		5-2-3- Royalties of local people in wood production industries	
	Element 5-3: Sustainability of benefits	5-3-1- Annual wood production based on a sustainable harvesting	
		5-3-2- Annual non wood production based on a sustainable harvesting	
		5-3-3- Return of capital	
		5-3-4- Productivity Index	
		5-3-5- Employments	
		5-3-6- Average income of main (jobs) working groups	
		5-3-7- Area of forest protect for water harvesting	
	Element 5-4: International partnerships	5-4-1- Investment in international forest sector	
		5-4-2- Cooperation with other countries in forest monitoring (data collecting) and reporting on C&I for SFM	
	Criterion 6 Social responsibility	Element 6-1: Expected programs for local people rights	6-1-1- Increase of local people partnership in development of policies, implementation and agreement of SFM
			6-1-2- Protect of the local people right in legal agreement, commitment and program processing in SFM
			6-1-3- Forest area under local people management
		Element 6-2: Traditional land use and local forest related ecologic knowledge	6-2-1- Number of studies on traditional land use which employed in forest management
			6-2-2- Local people income based upon traditional knowledge
Element 6-3:		6-3-1- Economical diversity in forest related communities	

	Comfort and satisfaction of forest related communities	6-3-2- Educational and training gained by forest related communities
		6-3-3- Employment rate in forest related communities
		6-3-4- Number of low income people in forest related communities
	Element 6-4: Effective and suitable decision making	6-4-1- Group (sector) which are satisfied from civil society participation in SFM process
		6-4-2- Acceptance (follow up) of Law, Regulation and management rules in related to SFM
		6-4-3- Percentage of forest area which designed (programmed), managed and implemented by people participation
	Element 6-5: Information for decision making	6-5-1- Coverage, real, replicate, level of confidence of collected data in related to the forest
		6-5-2- Availability of forest related data to the people
		6-5-3- Investment in R&D and forest education and industrial wood production
		6-5-4- Number of new and updated standards and guidelines of forest management in related to the ecologic subjects
		6-5-5- Extension and usage of improved new technology
		6-5-6- Technology and new capacity to evaluate social-economic consequences of implementation of new technologies
	Element 6-6: Recreation facilities	6-6-1- Availability and usage of recreation facilities
		6-6-2- Variable usage of forest in social level
		6-6-3- Area and percentage of forest which has been managed for public recreation and tourisms
		6-6-4- Number and type of facility in relation to the forest area and population which has been managed for public recreation and tourisms
		6-6-5- Number of visitors in relation to the forest area and population to the areas which has been managed for public recreation and tourisms
		6-6-6- Number and possibility of fishing and game
	Criterion 7: Legal and Institutional condition	7-1- Availabilities of policies, laws and suitable regulations in national and regional level
7-2- Implementing laws in different levels and possibility of evaluations		
7-3- Availability of suitable institutions and instruments		
7-4- Economic and financial framework and instruments		
7-5- Social informative and advisory instruments		
7-6- Research and extension capacities		
7-7- Usage of traditional experiences, knowledge and technologies		
7-8- Transfer and usage of suitable (environmentally sound) technologies		
7-9- Capabilities of implementing , related international laws		
Σ= 7 Criteria	15 Elements	93 Indicators

5.4 ITTO C&I for the sustainable management of tropical forests

The ITTO C&I for the sustainable management of tropical forests (2016) comprise seven criteria, 18 indicator groups that subdivide the criteria, and 58 indicators.

Criterion 1: Enabling conditions for sustainable forest management

Policy, legal and governance framework

- 1.1 Policies, laws and regulations for governing forests
- 1.2 Forest tenure and ownership
- 1.3 Forest governance

Institutional framework

- 1.4 Institutions responsible for, and supportive of, forest management
- 1.5 Availability of professional and technical personnel to perform and support forest management

Planning and monitoring framework

- 1.6 Integration of forests in national and subnational land-use planning
- 1.7 Capacity and mechanisms for management planning & the periodic monitoring of implementation
- 1.8 Long-term projections, strategies and plans for production PFE and protection PFE
- 1.9 Stakeholder participation in land-use & forest management planning, monitoring and assessment

Economic framework

- 1.10 National, subnational and international public and private funding committed to SFM
- 1.11 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 of forests committed to production and protection
- 2.3 Extent and percentage of total land area under each forest type
- 2.4 Multiyear forest management plans in FMUs
- 2.5 Forest area in compliance schemes
- 2.6 Change in forested area
- 2.7 Forest condition
- 2.8 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 Vulnerability of forests to natural disturbances
- 3.3 Forest resilience and climate-change adaptation

Restoration of degraded forests and lands

- 3.4 Degraded forests and landscapes restored
- 3.5 Area of formerly degraded forest or forest land restored

Criterion 4: Forest production

Resource assessment

- 4.1 Natural production forest inventories, by product
- 4.2 Actual and allowable harvest of wood and non-wood products in natural forests
- 4.3 Actual harvest of wood and non-wood products in planted forests
- 4.4 Forest carbon stock

Harvesting planning and control procedures

- 4.5 Timber harvesting arrangements in natural production forests

- 4.6 Forest product tracking systems or similar control mechanisms
- 4.7 Historical records on the extent, nature and management of forests

Silviculture in natural and planted forests

- 4.8 Reduced impact harvesting and silvicultural operations
- 4.9 Silvicultural management in planted forests
- 4.10 Strategic monitoring of silvicultural systems in natural and planted forests

Criterion 5: Forest biological diversity

Ecosystem diversity

- 5.1 Forest extent in protected areas
- 5.2 Buffer zone management and connectivity of protected forest areas

Species diversity

- 5.3 Threatened forest-dependent species
- 5.4 Procedures for conserving tree species diversity in natural tropical forests

Genetic diversity

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

Biodiversity conservation in production forests

- 5.6 Biodiversity conservation measures in natural production forests
- 5.7 Biodiversity conservation 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 Protection of downstream catchment values at the landscape level

Protective functions in production forests

- 6.3 Soil productivity and water retention capacity in production forests
- 6.4 Area of production PFE considered environmentally sensitive and protected
- 6.5 Forest engineering for soil and water protection

Criterion 7: Economic, social and cultural aspects

Economic aspects

- 7.1 Contribution of the forest sector to gross domestic product
- 7.2 Value of domestically produced forest products and environmental services
- 7.3 Wood and non-wood forest product processing capacities and efficiency

Social and cultural aspects

- 7.4 Capacity building of the workforce in forest management and forest industry
- 7.5 Procedures to ensure the health and safety of forest workers
- 7.6 Mechanisms for the equitable sharing of the costs and benefits of forest management
- 7.7 Mechanisms for resolving disputes between forest stakeholders
- 7.8 Local livelihoods and forest management
- 7.9 Forests reserved for specific cultural, research or educational purposes

Community and indigenous peoples' rights and participation in forest management

- 7.10 Tenure and user rights of indigenous peoples & local communities over publicly owned forests
- 7.11 Involvement of indigenous peoples and local communities in forest management
- 7.12 Recognition and value of forest-management knowledge and skills of local people

5.5 Global Forest Resources Assessment 2015

The Global Forest Resources Assessment 2015 (FRA 2015) contains 7 themes, 20 thematic questions and 46 indicators (<http://www.fao.org/3/a-i4808e.pdf>)

Forest area and forest characteristics

QUESTION 1: WHAT IS THE AREA OF FOREST AND OTHER WOODED LAND AND HOW HAS IT CHANGED OVER TIME?

- Forest and other wooded land 2015
- Extent of forest 1990-2015
- Other wooded land 1990-2015
- Forest expansion 1990–2010
- Deforestation 1990–2010
- Reforestation 1990–2010

QUESTION 2: WHAT IS THE AREA OF NATURAL AND PLANTED FOREST AND HOW HAS IT CHANGED OVER TIME?

- Forest characteristics 2015
- Primary forest 1990-2015
- Other naturally regenerated forest 1990-2015
- Planted forest 1990-2015
- Other naturally regenerated and planted forest 2015
- Mangroves 1990–2015

Production

QUESTION 3: WHAT ARE THE STOCKS AND GROWTH RATES OF THE FORESTS AND HOW HAVE THEY CHANGED?

- Growing stock in forest and other wooded land 2015
- Trends in forest growing stock 1990-2015
- Trends in other wooded land growing stock 1990-2015
- Growing stock composition 2010
- Net annual increment in forest 1990-2015
- Biomass stock in forest and other wooded land 2015
- Trends in living forest biomass 1990-2015
- Carbon stock in forest and other wooded land 2015
- Carbon stock in living forest biomass 1990-2015

QUESTION 4: WHAT IS THE STATUS OF FOREST PRODUCTION AND HOW HAS IT CHANGED OVER TIME?

- Production forest 1990-2015
- Multiple-use forest 1990-2015
- Total wood removals
- Woodfuel removals

Protective functions and selective ecosystem services

QUESTION 5: HOW MUCH FOREST AREA IS MANAGED FOR PROTECTION OF SOIL AND WATER AND ECOSYSTEM SERVICES?

- Protection of soil and water 2015
- Ecosystem services, cultural or spiritual values 2015
- Protection and ecosystem services 1990–2015

Biodiversity and conservation

QUESTION 6: HOW MUCH FOREST AREA IS PROTECTED AND DESIGNATED FOR THE CONSERVATION OF BIODIVERSITY AND HOW HAS IT CHANGED OVER TIME?

- Conservation of biodiversity 1990-2015
- Forest area within protected areas 1990-2015

Conservation and protected forest areas 1990–2015

Disturbance

QUESTION 7: WHAT IS THE AREA OF FOREST AFFECTED BY WOODY INVASIVE SPECIES?

Area affected by woody invasive species 2005-2010

QUESTION 8: HOW MUCH FOREST AREA IS DAMAGED EACH YEAR?

Total land area burned 2003-2012

Total forest area burned 2003-2012

Measuring progress towards sustainable forest management (SFM)

i: National-scale progress towards SFM

QUESTION 10: WHAT FOREST POLICY AND REGULATORY FRAMEWORK EXISTS TO SUPPORT IMPLEMENTATION OF SUSTAINABLE FOREST MANAGEMENT (SFM)?

Policies supporting SFM

Legislation and regulations supporting SFM

QUESTION 11: IS THERE A NATIONAL PLATFORM THAT PROMOTES STAKEHOLDER PARTICIPATION IN FOREST POLICY DEVELOPMENT?

QUESTION 12: WHAT IS THE FOREST AREA INTENDED TO BE IN PERMANENT FOREST LAND USE AND HOW HAS IT CHANGED?

QUESTION 13: HOW DOES YOUR COUNTRY MEASURE AND REPORT PROGRESS TOWARDS SFM AT THE NATIONAL LEVEL?

National platform, stakeholders, permanent forest land use and reporting

ii: Operational-scale progress towards SFM

QUESTION 13: HOW DOES YOUR COUNTRY MEASURE AND REPORT PROGRESS TOWARDS SFM AT THE NATIONAL LEVEL?

Methods measuring progress towards SFM

QUESTION 14: WHAT IS THE AREA OF FOREST UNDER A FOREST MANAGEMENT PLAN AND HOW IS THIS MONITORED?

Forest management plan 2010 and monitoring

QUESTION 15: HOW ARE STAKEHOLDERS INVOLVED IN THE MANAGEMENT DECISION-MAKING FOR PUBLICLY-OWNED FORESTS?

Stakeholder involvement at operational scale

QUESTION 16: WHAT IS THE AREA OF FOREST UNDER AN INDEPENDENTLY VERIFIED FOREST CERTIFICATION SCHEME?

Forest Stewardship Council (FSC) certification 2000-2014

Programme for the Endorsement of Forest Certification (PEFC) 2000-2014

Domestic forest management certification 2000-2012

Economics and livelihoods

QUESTION 17: HOW MUCH MONEY DO GOVERNMENTS COLLECT FROM AND SPEND ON FORESTS?

QUESTION 18: WHAT IS THE CONTRIBUTION OF FORESTRY TO GROSS DOMESTIC PRODUCT (GDP)?

Revenues, expenditures and contribution of forestry to GDP (1 000 USD)

QUESTION 19: WHO OWNS AND MANAGES THE FORESTS AND HOW HAS THIS CHANGED?

Forest ownership 1990-2010 (1 000 ha)

QUESTION 20: HOW MANY PEOPLE ARE DIRECTLY EMPLOYED IN FORESTRY?

Employment in forestry 1990-2010

5.6 National C&I sets

All information provided in this document should facilitate the elaboration of nation C&I sets. There are several well developed national C&I sets based on and derived from the above introduced regional C&I sets (e.g. from Estonia, Russia, Iran, Austria, Finland, Switzerland). For further inspiration on additional indicators of national importance, please have a look at the national C&I sets which were presented at the 1st project WS in Yerevan. All presentations and related Background Documents are available at the project website: <https://www.unece.org/index.php?id=43759#/>

Unedited Draft

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Annex 1:

Shopping List of Indicators

The below indicators are extracted from the indicator sets of FOREST EUROPE (FE), Montreal Process (MP), LFCC Process (LFCC), ITTO and FRA and are grouped according to the internationally agreed seven thematic elements of SFM (UNFF, 2007). Their origin is indicated by abbreviations.

Indicators which address the same topic or issue are grouped and are highlighted with the same background colour (grey or white). If there are more than two indicators per sub group a heading is given. The indicators are numbered with three digits, the first indicates the thematic elements, the second the sub group and the third the indicator (e.g. indicator “2.3.2 Primary forest” belongs to the thematic element “2. Biological diversity”, sub group “3 Naturalness” and is the 2nd indicator of that sub group). Ideally, from such a sub group the one best suitable indicator should be chosen. However, sometimes also two indicators might be needed to cover the national needs, or none of the listed indicators might fit. The shopping list should only be an inspiration and food for thoughts not a compulsory source of indicators.

1. Extent of forest resources

The theme expresses an overall desire to have adequate forest cover and stocking, including trees outside forests, to support the social, economic and environmental dimensions of forestry. For example, the existence and extent of specific forest types are important as a basis for conservation efforts. The theme encompasses ambitions to reduce deforestation and to restore and rehabilitate degraded forest landscapes. It also includes the important function of forests and trees outside forests to store carbon and thereby contribute to moderating the global climate.

Sub Group	No.	Ref.	Indicator in English	Название индикатора на русском
1.1 FOREST AREA	1.1.1	ITTO	Extent and percentage of total land area under comprehensive land-use plans	Площадь и процент всей площади земель, покрытых всесторонними планами землепользования
	1.1.2	ITTO	Extent of forests committed to production and protection	Площадь лесов, отведенных под производство и защиту
	1.1.3	ITTO	Extent and percentage of total land area under each forest type	Площадь и процент всей земли под каждым типом лесов
	1.1.4	ITTO	Forest area in compliance schemes	Площадь лесов в схемах соответствия
	1.1.5	LFCC	Increase or decrease of forest area, with the reason	Увеличение или сокращение площади леса, вместе с причиной
	1.1.6	FE	Area of forest and other wooded land, classified by forest type and by availability for wood supply, and share of forest and other wooded land in total land area	Площадь лесов и других покрытых древесной растительностью земель, классифицированных по типу леса и возможности их эксплуатации, а также доля лесов и других покрытых древесной растительностью земель в общей площади земель
	1.1.7	FRA	Forest and other wooded land	Лесные и другие лесистые земли
	1.1.8	FRA	Extent of forest	Площадь лесов

1.2 PRODUCTION	1.2.1	FRA	Production forest	Производственный лес
	1.2.2	MP	Area and percent of forest land and net area of forest land available for wood production	Площадь и доля лесных земель, а также площадь лесных земель, доступных для эксплуатации
	1.3.1	FRA	Multiple-use forest	Лес многоцелевого назначения
	1.4.1	FRA	Other wooded land	Другие лесистые земли
1.5 CHANGE	1.5.1	ITTO	Change in forested area	Изменение площади лесов
	1.5.2	FRA	Forest expansion	Расширение лесов
1.6 CHARACTERISTICS	1.6.1	MP	Area and percent of forest by forest ecosystem type, successional stage, age class, and forest ownership or tenure	Площадь и доля лесов по типам лесных экосистем, стадиям сукцессии, классам возраста и формам собственности
	1.6.2	FRA	Forest characteristics	Характеристики леса
	1.6.3	LFCC	Forest area, age class in ecozone	Площадь леса, возрастной класс в экозоне
	1.6.4	LFCC	Forest area, age class all types of soil and protected zone from geomorphology point of view	Площадь леса, возрастной класс всех видов почв и охраняемых территорий с точки зрения геоморфологии
	1.7.1	LFCC	Percentage of crown cover	Процент древесного покрова
1.8 GROWING STOCK	1.8.1	FE	Growing stock on forest and other wooded land, classified by forest type and by availability for wood supply	Запас древесины в лесах и на других покрытых древесной растительностью землях, классифицированных по типу леса и возможности их эксплуатации
	1.8.2	MP	Total growing stock and annual increment of both merchantable and non-merchantable tree species in forests available for wood production	Общий запас древесины и годовой прирост коммерческой и некоммерческой древесины в лесах, доступных для эксплуатации
	1.8.3	MP	Area, percent, and growing stock of plantations of native and exotic species	Площадь, доля занимаемой площади и запас древесины плантаций аборигенных и экзотических видов
	1.8.4	FRA	Growing stock in forest and other wooded land	Запас древесины в лесу и на других лесистых землях
	1.8.5	FRA	Trends in forest growing stock	Тренды запаса древесины в лесу
	1.8.6	FRA	Trends in other wooded land growing stock	Тренды запаса древесины на других лесистых землях
	1.8.7	FRA	Growing stock composition	Состав запасов древесины
	1.9.1	FE	Age structure and/or diameter distribution of forest and other wooded land, classified by availability for wood supply	Возрастная структура и/или распределение по диаметру деревьев в лесах и на других покрытых древесной растительностью землях, классифицированных по возможности их эксплуатации
1.10 CARBON STOCK	1.10.1	FE	Carbon stock and carbon stock changes in forest biomass, forest soils and in harvested wood products	Запасы углерода и изменения запасов углерода в биомассе лесов, лесных почвах и в заготовленной древесной продукции

	1.10.2	MP	Total forest ecosystem carbon pools and fluxes	Общий пул и потоки углерода в лесных экосистемах
	1.10.3	MP	Total forest product carbon pools and fluxes	Общий пул и потоки углерода в лесной продукции
	1.10.4	ITTO	Forest carbon stock	Запасы углерода в лесу
	1.10.5	FRA	Carbon stock in forest and other wooded land	Запасы углерода в лесу и на других лесистых землях
	1.10.6	FRA	Carbon stock in living forest biomass	Запасы углерода в живой лесной биомассе
	1.10.7	LFCC	Carbon storage in forest ecosystems, according to forest type and age class	Накопленный углерод в лесных экосистемах, согласно типам и возрастным классам леса
1.11 CARBON CHANGE	1.11.1	LFCC	Changes of net carbon in forest ecosystem	Изменение нетто углерода в лесной экосистеме
	1.11.2	LFCC	Net change in forest Carbon production	Нетто изменение в производстве углерода в лесу
	1.12.1	LFCC	Carbon emission in forest sector	Выброс углерода в лесном секторе
	1.13.1	LFCC	Net Carbon destruction	Нетто разрушение углерода

2. Biological diversity

The theme concerns the conservation and management of biological diversity at ecosystem (landscape), species and genetic levels. Such conservation, including the protection of areas with fragile ecosystems, ensures that diversity of life is maintained, and provides opportunities to develop new products in the future, including medicines. Genetic improvement is also a means of increasing forest productivity, for example to ensure high wood production levels in intensively managed forests.

Sub Group	No.	Ref.	Indicator in English	Название индикатора на русском
2.1 SPECIES	2.1.1	FE	Area of forest and other wooded land, classified by number of tree species occurring	Площадь лесов и других покрытых древесной растительностью земель, классифицированных по количеству древесных пород
	2.1.2	MP	Species diversity	Видовое разнообразие
2.2 REGENERATION	2.2.1	FE	Total forest area by stand origin and area of annual forest regeneration and expansion	Общая площадь лесов по происхождению и площадь ежегодного восстановления и экспансии лесов
	2.2.2	LFCC	Natural regeneration of species	Естественное восстановление видов
	2.2.3	FRA	Other naturally regenerated forest	Другие естественно регенерировавшие леса
	2.2.4	LFCC	Forest area which regenerate successfully after harvesting	Площадь леса, успешно восстанавливающаяся после заготовки
	2.2.5	FRA	Other naturally regenerated and planted forest	Другие естественно регенерировавшие и посаженные леса
2.3 NATURALNESS	2.3.1	FE	Area of forest and other wooded land by class of naturalness	Площадь лесов и других покрытых древесной растительностью земель по классу естественности
	2.3.2	FRA	Primary forest	Первичный лес
	2.3.3	FRA	Planted forest	Посаженные леса
	2.3.4	FRA	Mangroves	Мангровые заросли
2.4 SPECIES DISTRIBUTION	2.4.1	MP	Number of native forest associated species	Число аборигенных видов, связанных с лесом
	2.4.2	LFCC	Population of main and key species	Популяция основных и ключевых видов
	2.4.3	LFCC	Population of species in a selected forest	Популяция видов в конкретном лесу
	2.4.4	LFCC	Species distributions	Распределение видов
2.5 INVASIVE SPECIES	2.5.1	LFCC	Endemic and invader species	Эндемичные и инвазивные виды
	2.5.2	FRA	Area affected by woody invasive species	Площадь, пораженная инвазивными древесными видами
	2.5.3	FE	Area of forest and other wooded land dominated by introduced tree species	Площадь лесов и других покрытых древесной растительностью земель с преобладанием интродуцированных древесных пород
	2.6.1	FE	Volume of standing deadwood and of lying deadwood on forest and other wooded land	Объем стоящей на корню и лежащей на земле мертвой древесины в лесах и на других покрытых древесной растительностью землях

2.7 CONSERVATION	2.7.1	FE	Area managed for conservation and utilisation of forest tree genetic resources (in situ and ex situ genetic conservation) and area managed for seed production	Площадь, управляемая для сохранения и использования лесных древесных генетических ресурсов (сохранения генетических ресурсов непосредственно на месте и вне их естественного ареала) и площадь для производства семян
	2.7.2	MP	Status of on-site and off-site efforts focused on conservation of genetic diversity	Состояние усилий <i>in situ</i> и <i>ex situ</i> , направленных на сохранение генетического разнообразия
	2.7.3	ITTO	<i>In situ</i> conservation of genetic variation within specified forest tree species	<i>In situ</i> консервация генетической изменчивости конкретных видов лесных деревьев
	2.7.4	MP	Status of on-site and off-site efforts focused on conservation of species diversity	Состояние усилий <i>in situ</i> и <i>ex situ</i> , направленных на сохранение видового разнообразия
	2.7.5	MP	Number and geographic distribution of forest associated species at risk of losing genetic variation and locally adapted genotypes	Число и географическое расположение связанных с лесом аборигенных видов, находящихся под угрозой потери генетического разнообразия, и локально адаптированных генотипов
	2.7.6	MP	Population levels of selected representative forest associated species to describe genetic diversity	Популяционный уровень связанных с лесом репрезентативных видов, выбранных для описания генетического разнообразия
	2.7.7	ITTO	Procedures for conserving tree species diversity in natural tropical forests	Процедуры консервирования разнообразия видов деревьев в естественных тропических лесах
	2.7.8	LFCC	Genetic diversity in seed reforestation	Генетическое разнообразие семенного лесовосстановления
	2.7.9	LFCC	<i>In situ</i> and <i>ex situ</i> conservation of endanger species and species with economical value in each ecozone	Консервация видов, находящихся под угрозой, и видов, имеющих экономическую ценность, <i>in situ</i> и <i>ex situ</i> в каждой экозоне
2.8 FRAGMENTATION	2.8.1	MP	Fragmentation of forests	Фрагментация лесов
	2.8.2	LFCC	Forest type fragmentation	Фрагментация типов лесов
	2.8.3	FE	Area of continuous forest and of patches of forest separated by non-forest lands	Площадь сплошных лесов и участков леса, разделенных нелесными землями
2.9 THREATENED SPECIES	2.9.1	FE	Number of threatened forest species, classified according to IUCN Red List categories in relation to total number of forest species	Число охраняемых видов лесной фауны и флоры, классифицированных в соответствии с категориями Красного списка МСОП, по отношению к общему числу видов лесной фауны и флоры
	2.9.2	MP	Number and status of native forest associated species at risk, as determined by legislation or scientific assessment	Число и статус аборигенных видов, связанных с лесом и находящихся под угрозой исчезновения, согласно природоохранному законодательству или оценками экспертов
	2.9.3	ITTO	Threatened forest-dependent species	Зависимые от леса виды, находящиеся под угрозой

	2.9.4	LFCC	Endangered species in forest	Лесные виды, находящиеся под угрозой исчезновения
2.10 PROTECTED AREAS	2.10.1	FE	Area of forest and other wooded land protected to conserve biodiversity, landscapes and specific natural elements, according to MCPFE categories	Площадь лесов и других покрытых древесной растительностью земель, охраняемая с целью сохранения биологического разнообразия, ландшафтов и особых природных элементов, согласно категориям Министерской конференции по защите лесов в Европе
	2.10.2	MP	Area and percent of forest in protected areas by forest ecosystem type, and by age class or successional stage	Площадь и доля лесов особо охраняемых природных территорий по типам леса, классам возраста или стадиям сукцессии
	2.10.3	FRA	Conservation of biodiversity	Сохранение биоразнообразия
	2.10.4	FRA	Forest area within protected areas	Площадь лесов внутри охраняемых территорий
	2.10.5	FRA	Conservation and protected forest areas	Заповедные и охраняемые лесные территории
	2.10.6	FRA	Protection and ecosystem services	Защитные и экосистемные услуги
	2.10.7	ITTO	Forest extent in protected areas	Площадь лесов в охраняемых районах
	2.10.8	LFCC	Forest protected zones	Лесные охраняемые зоны
	2.10.9	LFCC	Area of protected forest ecosystems	Площадь охраняемых лесных экосистем
	2.10.10	ITTO	Buffer zone management and connectivity of protected forest areas	Управление буферных зон и связанность охраняемых лесов
2.11 Biod. Cons.	2.11.1	ITTO	Biodiversity conservation measures in natural production forests	Меры консервации биологического разнообразия в естественных производственных лесах
	2.11.2	ITTO	Biodiversity conservation in planted forests	Консервация биологического разнообразия в лесонасаждениях
	2.12.1	LFCC	Forest parks	Лесные парки

3. Forest health and vitality

Forests need to be managed so that the risks and impacts of unwanted disturbances are minimized, including wildfires, airborne pollution, storm felling, invasive species, pests, diseases and insects. Such disturbances may impact social and economic as well as environmental dimensions of forestry.

Sub Group	No.	Ref.	Indicator in English	Название индикатора на русском
3.1 DEPOSITION	3.1.1	ITTO	Forest condition	Состояние леса
	3.1.2	FE	Deposition and concentration of air pollutants on forest and other wooded land	Осаждение и концентрация загрязняющих атмосферу веществ на лесных и других покрытых древесной растительностью землях
	3.1.3	FE	Chemical soil properties (pH, CEC, C/N, organic C, base saturation) on forest and other wooded land related to soil acidity and eutrophication, classified by main soil types	Химические свойства почвы (рН, емкость катионного обмена, отношение содержания органического углерода к общему азоту, содержание органического углерода, насыщенность основаниями) в лесах и на других покрытых древесной растительностью землях, связанных с кислотностью почв и эвтрофикацией, классифицированных по основным типам почв
	3.2.1	FE	Defoliation of one or more main tree species on forest and other wooded land in each of the defoliation classes	Дефолиация одной или нескольких основных древесных пород в лесах и на других покрытых древесной растительностью землях для каждого из классов дефолиации
3.3 DAMAGED FORESTS	3.3.1	FE	Forest and other wooded land with damage, classified by primary damaging agent (abiotic, biotic and human induced)	Поврежденные леса и другие покрытые древесной растительностью земли, классифицированные по основному фактору повреждения (абиотический, биотический и антропогенный).
	3.3.2	MP	Area and percent of forest affected by biotic processes and agents (e.g. disease, insects, invasive species) beyond reference conditions	Площадь и доля лесов, подверженных негативным биотическим процессам и факторам (вредные насекомые, болезни леса, инвазивные виды), которые превышают обычные (естественные) показатели
	3.3.3	MP	Area and percent of forest affected by abiotic agents (e.g. fire, storm, land clearance) beyond reference conditions	Площадь лесов, подверженных негативным абиотическим факторам (лесные пожары, ураганы, расчистка земель), которые превышают обычные (естественные) показатели
	3.3.4	LFCC	Forest area damaged by: forest fire, insects, pests, disease, wood harvesting (forest health and vigor)	Площадь леса, поврежденная: лесным пожаром, насекомыми, вредителями, болезнями, заготовкой древесины (здоровье и энергия леса)
	3.3.5	LFCC	Forest area damaged by: drought, acid wash and ozone impact	Площадь леса, поврежденная: засухой, влиянием кислотных дождей и озона
	3.3.6	FRA	Total land area burned	Общая площадь выгоревших земель
	3.3.7	FRA	Total forest area burned	Общая площадь выгоревших лесов

	3.3.8	LFCC	Area of watershed which are damaged (degraded) because of land use change in last 20 years	Площадь бассейнов рек, поврежденных (деградировавших) из-за изменения землепользования в течении последних 20 лет
	3.3.9	ITTO	Threats to forests caused directly by human activities	Угрозы для леса, вызванные непосредственно человеческой деятельностью
	3.3.10	ITTO	Reduced impact harvesting and silvicultural operations	Заготовка и лесоводство со сниженным воздействием
3.4 DEGRADATION	3.4.1	FE	Trends in forest land degradation	Тенденции в деградации лесных земель
	3.4.2	LFCC	Forest ecosystem degradation	Деградация лесных экосистем
	3.4.3	ITTO	Degraded forests and landscapes restored	Восстановленные деградированные леса и ландшафты
	3.4.4	FRA	Deforestation	Обезлесение
3.5 RESTORATION	3.5.1	ITTO	Area of formerly degraded forest or forest land restored	Площадь ранее деградированных восстановленных лесов и лесных земель
	3.5.2	LFCC	Rehabilitation of arid and semi-arid zone	Восстановление засушливых и полужасушливых зон
	3.5.3	FRA	Reforestation	Лесовосстановление
	3.5.4	LFCC	Afforestation	Лесовосстановление
3.6 RESILIENCE	3.6.1	ITTO	Vulnerability of forests to natural disturbances	Уязвимость лесов по отношению к природным катаклизмам
	3.6.2	ITTO	Forest resilience and climate-change adaptation	Стойкость лесов и адаптация к изменению климата

4. Productive functions of forest resources

Forests and trees outside forests provide a wide range of wood and non-wood forest products. This theme expresses the ambition to maintain an ample and valuable supply of primary forest products, while at the same time ensuring that production and harvesting are sustainable and do not compromise the management options of future generations.

Sub Group	No.	Ref.	Indicator in English	Название индикатора на русском
4.1 INCREMENT	4.1.1	FE	Balance between net annual increment and annual fellings of wood on forest available for wood supply	Баланс между чистым годовым приростом и ежегодными рубками в лесах доступных для эксплуатации
	4.1.2	FRA	Net annual increment in forest	Чистый годовой прирост в лесу
	4.1.3	LFCC	Mean annual increments (growth) based upon forest type and age class	Среднегодовой прирост, в зависимости от вида и возрастного класса леса
4.2 REMOVALS	4.2.1	MP	Annual harvest of wood products by volume and as a percentage of net growth or sustained yield	Ежегодная заготовка древесины, выраженная в объеме и доле от чистого прироста или расчетной лесосеки
	4.2.2	LFCC	Annual wood production based on a sustainable harvesting	Годовое производство древесины, основанное на устойчивой заготовке
	4.2.3	ITTO	Natural production forest inventories, by product	Инвентаризация естественного лесоводства, по продуктам
	4.2.4	ITTO	Actual and allowable harvest of wood and non-wood products in natural forests	Фактическая и допустимая заготовка древесных и недревесных продуктов в естественных лесах
	4.2.5	ITTO	Actual harvest of wood and non-wood products in planted forests	Фактическая заготовка древесных и недревесных продуктов в лесопосадках
	4.2.6	FRA	Total wood removals	Совокупная заготовка древесины
	4.2.7	FRA	Woodfuel removals	Заготовка древесного топлива
4.3 BIOMASS	4.3.2	LFCC	Percentage of biomass as volume (general type of forest)	Процент биомассы как объем (общий тип леса)
	4.3.3	FRA	Biomass stock in forest and other wooded land	Запас биомассы в лесу и на других лесистых землях
	4.3.4	FRA	Trends in living forest biomass	Тренды живой лесной биомассы
4.4 VALUE OF WOOD	4.4.1	FE	Quantity and market value of roundwood	Количество и рыночная стоимость круглого леса
	4.4.2	MP	Value and volume of wood and wood products production, including primary and secondary processing	Стоимость и объем производства древесины и древесной продукции, включая первичную и вторичную переработку
	4.4.3	ITTO	Value of domestically produced forest products and environmental services	Стоимость лесных продуктов и экологических услуг, произведенных внутри страны
	4.4.4	LFCC	(Forest production), total tree growth, economical and non-trade value trees	(Лесное производство), общий рост деревьев, деревьев, имеющих экономическую ценность и не имеющих торговую ценность

	4.5.1	LFCC	Value of secondary products from harvested wood product	Стоимость вторичных продуктов, полученных от продуктов заготовленной древесины
4.6 NON-WOOD PRODUCTS	4.6.1	LFCC	Annual non wood production based on a sustainable harvesting	Годовое недревесное производство, основанное на устойчивой заготовке
	4.6.2	FE	Quantity and market value of non-wood goods from forest and other wooded land	Количество и рыночная стоимость недревесных продуктов из лесов и других покрытых древесной растительностью земель
	4.6.3	MP	Value of non-wood forest products produced or collected	Стоимость и количество произведенной или собранной недревесной продукции
	4.6.4	LFCC	Value of non-wood products (non-trading)	Стоимость недревесной продукции (неторговой)
	4.6.5	MP	Annual harvest of non-wood forest products	Ежегодный объем заготовок недревесных лесных ресурсов
4.7 SERVICES	4.7.1	FE	Value of marketed services on forest and other wooded land	Стоимость платных услуг в лесах и других покрытых древесной растительностью землях
	4.7.2	LFCC	Value of forest related services (non-trading)	Стоимость услуг, связанных с лесом (неторговой)
	4.8.1	LFCC	Suitable habitat for wildlife with economic value	Подходящая естественная среда для имеющих экономическую ценность диких животных

5. Protective functions of forest resources

The theme addresses the role of forests and trees outside forests in moderating soil, hydrological and aquatic systems, maintaining clean water (including healthy fish populations) and reducing the risks and impacts of floods, avalanches, erosion and drought. Protective functions of forest resources also contribute to ecosystem conservation efforts and have strong cross-sectoral aspects, because the benefits to agriculture and rural livelihoods are high.

Sub Group	No.	Ref.	Indicator in English	Название индикатора на русском
5.1 SOIL AND WATER PROTECTION	5.1.1	FE	Area of forest and other wooded land designated to prevent soil erosion, preserve water resources, maintain other protective functions, protect infrastructure and managed natural resources against natural hazards	Площадь лесов и других покрытых древесной растительностью земель, предназначенная для предотвращения эрозии почвы, сохранения водных ресурсов, поддержания других защитных функций, защиты инфраструктуры и управляемых природных ресурсов от стихийных бедствий
	5.1.2	FRA	Protection of soil and water	Защита почвы и воды
	5.1.3	ITTO	Forest area managed primarily for the protection of soil and water	Площадь лесов, управляемых в первую очередь для защиты почв и воды
	5.1.4	ITTO	Area of production permanent forest estates (PFE) considered environmentally sensitive and protected	Площадь считающихся экологически чувствительными и защищенных производственных ПЛФ
	5.1.5	MP	Area and percent of forest whose designation or land management focus is the protection of soil or water resources	Площадь и доля лесов, которые предназначены или управляются с целью защиты почвы или водных ресурсов
	5.1.6	MP	Proportion of forest management activities that meet best management practices or other relevant legislation to protect soil resources	Доля лесохозяйственных мероприятий (например, подготовка участков, способы рубки), проводимых в соответствии с высшими достижениями лесоводственной науки или законодательством, направленным на сохранение почвенных ресурсов
	5.2.1	MP	Area and percent of forest land with significant soil degradation	Площадь и доля лесных земель со значительной деградацией почвы
5.3 WATER PROTECTION	5.3.1	MP	Proportion of forest management activities that meet best management practices, or other relevant legislation, to protect water related resources	Доля лесохозяйственных мероприятий, проводимых в соответствии с высшими достижениями лесоводственной науки или законодательством, направленным на сохранение водных ресурсов
	5.3.2	MP	Area and percent of water bodies, or stream length, in forest areas with significant change in physical, chemical or biological properties from reference conditions	Площадь и доля водных объектов или длина водных потоков в пределах лесных территорий со значительными изменениями физических, химических или биологических свойств по сравнению с фоновыми условиями
	5.3.3	LFCC	Area of forest protect for water harvesting	Площадь лесов, защищенных для сбора воды

	5.3.4	LFCC	Water level in forest zone	Уровень воды в лесной зоне
	5.3.5	ITTO	Protection of downstream catchment values at the landscape level	Защита ценности водосборов нижнего течения на уровне ландшафта
	5.4.1	ITTO	Soil productivity and water retention capacity in production forests	Производительность почвы и водоудерживающая способность в производственных лесах
	5.5.1	ITTO	Forest engineering for soil and water protection	Лесотехника по защите почв и воды

6. Socio-economic functions

The theme covers the contributions of forest resources to the overall economy, for example through employment, values generated through processing and marketing of forest products, and energy, trade and investment in the forest sector. It also addresses the important forest function of hosting and protecting sites and landscapes of high cultural, spiritual or recreational value, and thus includes aspects of land tenure, indigenous and community management systems, and traditional knowledge.

Sub Group	No.	Ref.	Indicator in English	Название индикатора на русском
6.1 PRODUCTIVITY	6.1.1	LFCC	Productivity Index	Индекс продуктивности
	6.1.2	ITTO	Wood and non-wood forest product processing capacities and efficiency	Потенциал и эффективность обработки древесных и недревесных лесных продуктов
6.2 GROSS DOMESTIC PRODUCT	6.2.1	FE	Contribution of forestry and manufacturing of wood and paper products to gross domestic product	Вклад лесного хозяйства и производства древесины и бумаги в валовой внутренний продукт.
	6.2.2	ITTO	Contribution of the forest sector to gross domestic product	Вклад лесного хозяйства в валовом внутреннем продукте
	6.2.3	FRA	Revenues, expenditures and contribution of forestry to GDP	Доходы, расходы и участие лесного хозяйства в ВВП
	6.2.4	LFCC	Share of wood production in GDP	Доля производства древесины в ВВП
	6.2.5	LFCC	Share of non-wood products in GDP	Доля недревесных продуктов в ВВП
	6.2.6	LFCC	Share of forest related services in GDP	Доля услуг, связанных с лесом, в ВВП
6.3 Trade	6.3.1	LFCC	Production, Consumption, Import and export of wood products	Производство, потребление, импорт и экспорт изделий из дерева
	6.3.2	LFCC	Production, Consumption, Import and export of non-wood products	Производство, потребление, импорт и экспорт недревесных изделий
	6.3.3	FE	Imports and exports of wood and products derived from wood	Импорт и экспорт древесины и продукции, полученной из древесины
	6.3.4	MP	Value and volume in round wood equivalents of exports and imports of wood products	Стоимость и объем (в эквиваленте круглого леса) экспорта и импорта древесной продукции
	6.3.5	MP	Exports as a share of wood and wood products production and imports as a share of wood and wood products consumption	Экспорт как доля от производства древесины и древесной продукции и импорт как доля от потребления древесины и древесной продукции

6.4 REVENUE	6.4.1	LFCC	Return of capital	Возврат капитала
	6.4.2	FE	Net revenue of forest enterprises	Чистый доход лесных предприятий.
	6.4.3	MP	Revenue from forest based ecosystem services	Доход от экологических услуг, предоставляемых лесом
	6.4.4	MP	Distribution of revenues derived from forest management	Распределение доходов, получаемых от лесного хозяйства
6.5 INVESTMENTS	6.5.1	FE	Total public and private investments in forests and forestry	Общие государственные и частные инвестиции в леса и лесное хозяйство.
	6.5.2	MP	Value of capital investment and annual expenditure in forest management, wood and non-wood forest product industries, forest-based ecosystem services, recreation and tourism	Объем капитальных инвестиций и ежегодных расходов на лесное хозяйство, производство древесной и недревесной продукции, предоставляемой лесом, экологические услуги, рекреацию и туризм
	6.5.3	MP	Annual investment and expenditure in forest-related research, extension and development, and education	Ежегодные инвестиции и расходы на исследования по лесной тематике и образование
	6.5.4	LFCC	Investment in R&D and forest education and industrial wood production	Инвестиции в исследования и разработки и лесное образование и производство промышленной древесины
	6.5.5	LFCC	Investment volume in forest growth, health, management, planted forest, wood processing and tourism	Объем инвестиций в рост, здоровье, управление лесов, посадку леса, переработку древесины и туризм
	6.5.6	LFCC	Investment in international forest sector	Инвестиции в международный лесной сектор
6.6 EMPLOYMENT	6.6.1	FE	Number of persons employed and labour input in the forest sector, classified by gender and age group, education and job characteristics	Число лиц, занятых в лесном секторе, и трудовые затраты в лесном секторе, классифицируемые по гендерным отношениям, возрастной группе, образованию и характеру выполняемой работы
	6.6.2	ITTO	Capacity building of the workforce in forest management and forest industry	Наращивание потенциала рабочей силы в управлении лесами и лесной промышленности
	6.6.3	FRA	Employment in forestry	Занятость в лесном хозяйстве
	6.6.4	MP	Employment in the forest sector	Занятость в лесном секторе
	6.6.5	LFCC	Employments	Занятость
6.7 WAGES	6.7.1	LFCC	Average income of main (jobs) working groups	Средний доход основных групп занятости
	6.7.2	MP	Average wage rates, annual average income and annual injury rates in major forest employment categories	Средние ставки заработной платы, ежегодный средний доход и ежегодный уровень травматизма по основным категориям занятости в лесном хозяйстве
6.8 DEPENDENCY	6.8.1	MP	Resilience of forest-dependent communities	Устойчивость зависимых от леса сообществ
	6.8.2	MP	Area and percent of forests used for subsistence purposes	Площадь и доля лесов, используемых для получения средств к существованию

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6.9 WORK SAFETY	6.9.1	FE	Frequency of occupational accidents and occupational diseases in forestry	Частота несчастных случаев на производстве и профессиональных заболеваний в лесном хозяйстве
	6.9.2	ITTO	Procedures to ensure the health and safety of forest workers	Процедуры обеспечения здоровья и безопасности лесных рабочих
6.10 CONSUMPTION	6.10.1	FE	Consumption per head of wood and products derived from wood	Потребление древесины и продукции, полученной из древесины на душу населения
	6.10.2	MP	Total and per capita consumption of wood and wood products in round wood equivalents	Общее потребление и потребление на душу населения древесины и древесной продукции в эквиваленте круглого леса
	6.10.3	MP	Total and per capita consumption of non-wood forest products	Общее потребление и потребление на душу населения недревесной продукции
6.11 WOOD ENERGY	6.11.1	FE	Share of wood energy in total primary energy supply, classified by origin of wood	Доля энергии, получаемой из древесины, в общем предложении первичных источников энергии с классификацией по происхождению древесины
	6.11.2	MP	Avoided fossil fuel carbon emissions by using forest biomass for energy	Сокращение эмиссии углерода из ископаемого топлива за счет использования лесной биомассы для получения энергии
	6.11.3	LFCC	Percentage of energy usage of renewable forest resources, compare to total energy use	Процент использования энергии из восстанавливаемых лесных ресурсов в сравнении с общим энергопотреблением
6.12 RECREATION	6.12.1	FE	The use of forests and other wooded land for recreation in terms of right of access, provision of facilities and intensity of use	Использование лесов и других покрытых древесной растительностью земель для отдыха с точки зрения права на доступ, обеспечения надлежащих условий и интенсивности использования
	6.12.2	MP	Area and percent of forests available and/or managed for public recreation and tourism	Площадь и доля лесов, доступных и/или управляемых для рекреации и туризма
	6.12.3	MP	Number, type, and geographic distribution of visits attributed to recreation and tourism and related to facilities available	Число, тип и географическое распределение посещений, связанных с рекреацией и туризмом, отнесенное к доступным объектам
	6.12.4	LFCC	Availability and usage of recreation facilities	Доступность и использование баз отдыха
	6.12.5	LFCC	Variable usage of forest in social level	Вариабельное использование леса на социальном уровне
	6.12.6	LFCC	Area and percentage of forest which has been managed for public recreation and tourism	Площадь и доля леса, управляемая для общественного отдыха и туризма
	6.12.7	LFCC	Number and type of facility in relation to the forest area and population which has been managed for public recreation and tourism	Число и типы объектов, которые управлялись для общественного отдыха и туризма, в сравнении с лесными площадями и населением

	6.12.8	LFCC	Number of visitors in relation to the forest area and population to the areas which has been managed for public recreation and tourisms	Число посетителей в сравнении с лесной площадью и населения - с площадями, которые управлялись для общественного отдыха и туризма
	6.13.1	LFCC	Number and possibility of fishing and game	Число и возможность рыбной ловли и дичи
6.14 TRADITIONAL KNOWLEDGE AND CULTURAL VALUES	6.14.1	FRA	Ecosystem services, cultural or spiritual values	Экосистемные услуги, культурные и духовные ценности
	6.14.2	LFCC	Number of studies on traditional land use which employed in forest management	Число исследований традиционного землепользования, используемых в управлении лесом
	6.14.3	LFCC	Usage of traditional experiences, knowledge and technologies	Использование традиционного опыта, знаний и технологий
	6.14.4	MP	Local people income based upon traditional knowledge	Доходы местного населения, основанные на традиционном знании
	6.14.5	ITTO	Forests reserved for specific cultural, research or educational purposes	Леса, предусмотренные для конкретных культурных, исследовательских и образовательных целей
6.15 LOCAL COMMUNITIES	6.15.1	MP	The importance of forests to people	Важность лесов для людей
	6.15.2	ITTO	Local livelihoods and forest management	Местные условия жизни и управление лесами
	6.15.3	LFCC	Economic diversity in forest related communities	Экономическое разнообразие в общинах, связанных с лесом
	6.15.4	LFCC	Educational and training gained by forest related communities	Образование и переподготовка, получаемая общинами, связанными с лесом
	6.15.5	LFCC	Employment rate in forest related communities	Занятость в общинах, связанных с лесом
	6.15.6	LFCC	Number of low income people in forest related communities	Число людей с низким доходом в общинах, связанных с лесом
	6.15.7	ITTO	Recognition and value of forest-management knowledge and skills of local people	Признание и придание значения знаний и навыков местного населения, связанных с управлением лесом
	6.16.1	MP	Recovery or recycling of forest products as a percent of total forest products consumption	Повторно перерабатываемая лесная продукция как доля от общего объема потребления древесной продукции
6.17 CERTIFICATION	6.17.1	FRA	Forest Stewardship Council (FSC) certification	Сертификация Лесного попечительского совета (ЛПС)
	6.17.2	FRA	Programme for the Endorsement of Forest Certification (PEFC)	Программа подтверждения сертификации леса (ППСЛ)
	6.17.3	FRA	Domestic forest management certification	Внутренняя сертификация лесопользования

7. Legal, policy and institutional framework

The theme includes the legal, policy and institutional arrangements necessary to support the above six thematic elements, including participatory decision-making, governance and law enforcement, and monitoring and assessment of progress. It also involves broader societal aspects, including fair and equitable use of forest resources, scientific research and education, infrastructure arrangements to support the forest sector, transfer of technology, capacity-building, and public information and communication.

Some of the below indicators are of qualitative/descriptive nature.

Sub-Group	No.	Ref.	Indicator in English	Название индикатора на русском
7.1 NATIONAL FOREST PROGRAMME	7.1.1	FE	National Forest Programmes or equivalent	Национальные лесные программы или их эквиваленты
	7.1.2	MP	Programmes, services and other resources supporting the sustainable management of forests	Программы, сервисы и другие ресурсы, поддерживающие устойчивое управление лесами
	7.1.3	FRA	National platform, stakeholders, permanent forest land use and reporting	Национальная платформа, заинтересованные стороны, постоянное использование лесных земель и отчетывание
	7.1.4	ITTO	Integration of forests in national and subnational land-use planning	Интеграция лесов в национальное и субнациональное планирование лесопользования
7.2 MANAGEMENT PLAN	7.2.1	LFCC	Number of new and updated standards and guidelines of forest management related to the ecologic subjects	Число новых и обновленных стандартов и методических рекомендаций по лесопользованию в предметах, связанных с экологией
	7.2.2	FRA	Forest management plan and monitoring	План лесопользования и мониторинг
	7.2.3	ITTO	Capacity and mechanisms for management planning & the periodic monitoring of implementation	Потенциал и механизмы планирования управления и периодического мониторинга реализации
	7.2.4	ITTO	Multiyear forest management plans in forest management units (FMUs)	Многолетние планы управления лесами в ЛХЕ
	7.2.5	ITTO	Long-term projections, strategies and plans for production permanent forest estates (PFE) and protection PFE	Долгосрочные прогнозы, стратегии и планы для разработки ПЛФ и защиты ПЛФ
7.3 INSTITUTIONAL FRAMEWORK	7.3.1	FE	Institutional frameworks	Организационная структура
	7.3.2	LFCC	Availability of suitable institutions and instruments	Наличие соответствующих институтов и инструментов
	7.3.3	ITTO	Institutions responsible for, and supportive of, forest management	Институты, ответственные за и поддерживающие управление лесами
	7.3.4	ITTO	Availability of professional and technical personnel to perform and support forest management	Наличие профессиональных и технических кадров для осуществления и поддержки управления лесами
LE-GAL-FRA-ME	7.4.1	FRA	Legislation and regulations sup-	Законодательство и нормативно-

			porting SFM	правовые акты, поддерживающие УЛП
	7.4.2	FE	Legal/regulatory framework: National (and/or sub-national) and International commitments	Правовая/нормативная база: национальные (и/или субнациональные) и международные обязательства
	7.4.3	MP	Enforcement of laws related to forests	Обеспечение правопорядка, относящегося к лесам
	7.4.4	MP	Legislation and policies supporting the sustainable management of forests	Юридические и политические основы для устойчивого управления лесами
	7.4.5	LFCC	Implementing laws in different levels and possibility of evaluations	Реализация законов на различных уровнях и возможность оценки
	7.4.6	LFCC	Capabilities of implementing , related international laws	Потенциал по реализации соответствующих международных законов
	7.4.7	LFCC	Acceptance (follow up) of Law, Regulation and management rules in related to SFM	Принятие (прослеживание) законов, нормативно-правовых актов и правил управления, связанных с УЛП
	7.4.8	LFCC	Local acceptance (follow up) of standard law related to the soil erosion	Принятие (прослеживание) местного стандартного закона, связанного с эрозией почвы
	7.4.9	LFCC	Local acceptance of soil erosion related the road construction and river	Признание на местном уровне эрозии почвы, связанной со строительством дорог и реками
7.5 ECONOMIC INSTRUMENTS	7.5.1	FE	Financial and economic instruments	Финансовые и экономические инструменты
	7.5.2	LFCC	Economic and financial framework and instruments	Экономические и финансовые рамки и инструменты
	7.5.3	ITTO	National, subnational and international public and private funding committed to SFM	Национальное, субнациональное и международное государственное и частное финансирование, предусмотренное для УЛП
	7.5.4	ITTO	Mechanisms for the equitable sharing of the costs and benefits of forest management	Механизмы равноправного распределения затрат и выгод управления лесами
	7.5.5	ITTO	Incentives to encourage SFM	Стимулы для поощрения УЛП
	7.5.6	MP	Taxation and other economic strategies that affect the sustainable management of forests	Таксация и другие экономические стратегии, влияющие на устойчивое управление лесами
	7.5.7	LFCC	Distribution of financial benefits of industries wood productions	Распределение финансовых выгод индустрии производства изделий из дерева
7.6 INFORMATION	7.6.1	LFCC	Social informative and advisory instruments	Социально-информативные и консультативные инструменты
	7.6.2	FE	Information and communication	Информация и связь
	7.6.3	LFCC	Coverage, real, replicate, level of confidence of collected data in related to the forest	Охват, реальность, репликация, уровень доверия связанных с лесом собранных данных
	7.6.4	LFCC	Availability of forest related data to the people	Доступность связанных с лесом данных для населения

	7.6.5	LFCC	Research and extension capacities	Потенциал для исследований и распространения знаний
7.7 ASSESSMENT	7.7.1	FRA	Methods measuring progress towards SFM	Методы измерения прогресса в направлении УЛП
	7.7.2	MP	Monitoring, assessment and reporting on progress towards sustainable management of forests	Мониторинг, оценка и отчет о прогрессе в достижении устойчивого управление лесами
	7.7.3	MP	Development and application of research and technologies for the sustainable management of forests	Развитие и применение науки и технологий для устойчивого управление лесами
7.8 STAKEHOLDER INVOLVEMENT	7.8.1	MP	Cross-sectoral policy and programme coordination	Межотраслевая политика и координация программ
	7.8.2	MP	Partnerships to support the sustainable management of forests	Партнерства для поддержки устойчивого управление лесами
	7.8.3	MP	Public participation and conflict resolution in forest-related decision making	Участие общественности и разрешение конфликтов при принятии решений в лесной сфере
	7.8.4	FRA	Stakeholder involvement at operational scale	Вовлечение заинтересованных сторон на операционном уровне
	7.8.5	ITTO	Stakeholder participation in land use & forest management planning, monitoring and assessment	Участие заинтересованных сторон планировании, мониторинге и оценке землепользования и управления лесами
	7.8.6	LFCC	Percentage of forest area which designed (programmed), managed and implemented by people participation	Доля лесной площади, планируемой, управляемой и осуществляемой при участии населения
	7.8.7	LFCC	Group (sector) which are satisfied from civil society participation in SFM process	Группы (сектора), удовлетворенные от участия гражданского общества в процессе УЛП
	7.8.8	LFCC	Increase of local people partnership in development of policies, implementation and agreement of SFM	Развитие сотрудничества с местным населением в разработке политик, осуществлении и согласовании УЛП
	7.8.9	LFCC	Protect of the local people right in legal agreement, commitment and program processing in SFM	Защита прав местного населения при обработке правовых соглашений, обязательств и программ в УЛП
	7.8.10	ITTO	Mechanisms for resolving disputes between forest stakeholders	Механизмы разрешения споров между заинтересованными сторонами лесного сектора
7.9 POLICIES	7.9.1	FRA	Policies supporting SFM	Политики, поддерживающие УЛП
	7.9.2	ITTO	Policies, laws and regulations for governing forests	Политики, законы и нормативно-правовые акты по управлению лесов
	7.9.3	ITTO	Forest governance	Управление лесами
	7.9.4	LFCC	Availabilities of policies, laws and suitable regulations in national and regional level	Наличие политик, законов и соответствующих нормативно-правовых актов на национальном и региональном уровнях
	7.9.5	FE	Policies, institutions and instru-	Политика, учреждения и инструменты

			ments to maintain and appropriately enhance forest resources and their contribution to global carbon cycles	для поддержания и надлежащего приумножения лесных ресурсов и их вклада в глобальный цикл углерода
	7.9.6	FE	Policies, institutions and instruments to maintain forest ecosystem health and vitality	Политика, учреждения и инструменты для поддержания санитарного состояния и жизнеспособности лесных экосистем
	7.9.7	FE	Policies, institutions and instruments to maintain and encourage the productive functions of forests	Политика, учреждения и инструменты для поддержания и повышения продуктивных функций лесов
	7.9.8	FE	Policies, institutions and instruments to maintain, conserve and appropriately enhance the biological diversity in forest ecosystem	Политика, учреждения и инструменты для поддержания, сохранения и надлежащего улучшения биологического разнообразия в лесных экосистемах
	7.9.9	FE	Policies, institutions and instruments to maintain and appropriately enhance of the protective functions in forest management	Политика, учреждения и инструменты для поддержания и надлежащего улучшения защитных функций в управлении лесами
	7.9.10	FE	Policies, institutions and instruments to maintain other socio-economic functions and conditions	Политика, учреждения и инструменты для поддержания других социально-экономических функций и условий
7.10 OWNER- SHIP	7.10.1	FE	Number of forest holdings, classified by ownership categories and size classes	Количество лесовладений, классифицированных по категориям собственности и размерам.
	7.10.2	FRA	Forest ownership	Владение лесами
7.11 TENURE RIGHTS	7.11.1	MP	Clarity and security of land and resource tenure and property rights	Ясность и гарантированность права собственности на землю и ресурсы
	7.11.2	ITTO	Forest tenure and ownership	Владение и собственность лесов
	7.11.3	ITTO	Tenure and user rights of indigenous peoples & local communities over publicly owned forests	Права коренных народов и местных общин по владению и пользованию лесами, находящимися в государственной собственности
	7.11.4	LFCC	Forest area under local people management	Площадь леса, управляемого местными населением
	7.11.5	ITTO	Involvement of indigenous peoples and local communities in forest management	Участие коренных народов и местных общин в управлении лесами
7.12 Concession	7.12.1	LFCC	Royalties (concessions) of local people in wood production industries	Роялти местного населения в индустрии производства изделий из дерева
	7.12.2	ITTO	Timber harvesting arrangements in natural production forests	Механизмы заготовки древесины в естественных производственных лесах
7.13 Control	7.13.1	ITTO	Forest product tracking systems or similar control mechanisms	Системы слежения лесных продуктов или аналогичные механизмы контроля
	7.13.2	ITTO	Historical records on the extent, nature and management of for-	Исторические данные по площади, природе и управлению лесов

			ests	
	7.14.1	ITTO	Silvicultural management in planted forests	Управления лесоводства в лесонасаждениях
	7.15.1	ITTO	Strategic monitoring of silvicultural systems in natural and planted forests	Стратегический мониторинг лесокультурных систем в естественных и посаженных лесах
	7.16.1	LFCC	Forest areas and time of wood production	Площадь лесов и время производства изделий из дерева
7.17 Pro- jects	7.17.1	LFCC	Forestry project	Лесные исследовательские проекты
	7.17.2	LFCC	Forestry research project and percentage of coverage areas	Лесные проекты и процент покрытых площадей
	7.18.	LFCC	Partnership in Climate Change Convention and other related issue in forest sector	Партнерство в Конвенции об изменении климата и других соответствующих вопросах, связанных с лесным сектором
	7.19.1	LFCC	Cooperation with other countries in forest monitoring (data collecting) and reporting on C&I for SFM	Сотрудничество с другими странами в мониторинге лесов (сбор данных) и отчетности по КиИ для УЛП
7.20 NEW TECHNOLOGY	7.20.1	LFCC	Extension and usage of improved new technology	Распространенность и использование улучшенных новых технологий
	7.20.2	LFCC	Transfer and usage of suitable (environmentally sound) technologies	Передача и использование соответствующих (экологически безопасных) технологий
	7.20.3	LFCC	Technology and new capacity to evaluate social-economic consequences of implementation of new technologies	Технологии и новый потенциал по оценке социально-экономических последствий использования новой технологии

Documents, links & contacts

Recommended readings concerning further specific indicator related questions on measurement units and reporting notes and contact persons:

Process	Website	Documents / Links	Contact persons
Montréal Process	www.montrealprocess.org https://www.montrealprocess.org/Resource/Criteria_and_Indicators/index.shtml	<p>The Montréal Process, Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests, Sep. 2015</p> <p>At a Glance -Montréal Process Criteria and Indicators Poster</p> <p>Montréal Process Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests TECHNICAL NOTES , July 2014</p>	Maria Palenova, palenova@gmail.com (Russian speaking)
Forest Europe (FE)	http://foresteurope.org	<p>Updated Pan-European indicators for Sustainable forest Management, http://foresteurope.org/wp-content/uploads/2016/11/III.-ELM_7MC_2_2015_MinisterialDeclaration_adopted-2.pdf#page=5</p> <p>Background Information, http://foresteurope.org/wp-content/uploads/2016/10/3AG_UPI_Updated_Backgr_Info.pdf</p> <p>Terms & Definitions, http://foresteurope.org/wp-content/uploads/2017/02/3AG_UPI_Updated_Terms_Definitions.pdf</p>	<p>Stefanie Linser, Stefanie.linser@efi.int;</p> <p>Rastislav Rasi, rastislav.rasi@foresteurope.org</p> <p>Maria Palenova, palenova@gmail.com (Russian speaking)</p>
Low Forest Cover Countries (LFCC)	No information in Russian or English		Mostafa Jafari, mostafajafari@libero.it
International Tropical Timber Organization (ITTO)	http://www.itto.int/	<p>Criteria and indicators for the sustainable management of tropical forests</p> <p>ITTO PD 21 (E) Web</p> <p>User-friendly C&I reporting format</p>	Tageshi Goto, goto@itto.int
FAO Forest Resources Assessment (FRA)	<p>En: http://www.fao.org/forest-resources-assessment/en/</p> <p>Ru: http://www.fao.org/forest-resources-assessment/ru/</p>	<p>FRA Desk Reference</p> <p>En: http://www.fao.org/3/a-i4808e.pdf</p> <p>Ru: http://www.fao.org/3/a-i4808r.pdf</p> <p>FRA Terms & Definitions</p> <p>En: http://www.fao.org/docrep/017/ap862e/ap862e00.pdf</p> <p>Ru: http://www.fao.org/docrep/017/ap862e/ap862e00.pdf</p>	Anssi Pekkarinen, FRA@fao.org

Annex 2:

Advanced considerations

Subsets of forest related indicators to address specific policy issues

Background

In autumn 2013 an EFI study (Wolfslehner et al., 2013) ascertained that the pan-European set of indicators for SFM is balanced and comprehensive in its approach. However, to address specific policy issues, it may be desirable to use a subset of the indicators to measure progress or to set goals, even to manage trade-offs. These subsets of indicators may be necessary only in certain regions, in certain countries or for a limited time or purpose according to emerging issues or changing needs, even though they are constructed inside the framework of the general indicator set.

The EFI Study (EFI, 2013) as well as the findings of a European Commission's Standing Forestry Committee ad hoc Working Group on sustainable forest management criteria and indicators (EC, 2015) have also shown, that data from SFM indicators are little known or used by other national, regional and international sectors (e.g. energy, biodiversity) or by broader indicator sets applied to the whole of society.

One reason is that the information collected for the forest sector indicators is not in a form which can be easily used and understood by the other sectors. Vice versa information generated by other sectors is often not used in the forest sector, as the data is not collected and reported sector specific but for the whole economy or for the environment, rural development, etc. where the forest sector is part of.

To remedy this, institutions, organizations or processes which may have a need for specific forest indicator information should be considered in the indicator development process. The indicator set should be designed with this need in mind, and should identify certain subsets which are relevant to specific policy challenges or emerging issues and which may build bridges to other sectors.

The application at global level for the SDGs and the FRA reporting as well as on regional level for the CFRQ (46 FOREST EUROPE MS) should also be considered in the elaboration of a national C&I set.

Forest related indicators relevant for other institutions, organizations or processes

Forest related indicators could be of particular relevance for UNFCCC, UNCCD, CBD and the European Union with regard to the following topics which are explained in more detail below:

- Rural development
- Environment & Biodiversity
- Resilience
- Climate change mitigation and adaptation
- Energy
- Bioeconomy
- Sub-set of key or headline indicators

Rural Development

Forestry is an integral part of rural development and support for sustainable and climate friendly land use includes forest area development and sustainable management of forests.

The work on SFM indicators can be relevant under rural development as far as it could support to assess the contribution from forestry measures to forest area development and sustainable forest management.

Non exhaustive list of possible indicators for a subset of forest-related <u>rural development</u> indicators - Thought starter	Source
Forest and other wooded land area, incl. change	Montreal Process Ind. 1.1.a, FOREST EUROPE (1.1), LFCC ind. 1-1-1, ITTO ind. 2.6, AICHI Ind., SDG 15.2.1 Ind.
Area and percent of forest land and net area of forest land available for wood production	Montréal Process Ind. 2a
Protected forest areas	Montréal Process ind. 1.1.b, LFCC ind. 1-1-5, FOREST EUROPE (4.9) & CMEF ¹ context indicator, SDG 15.2.1 Ind.
Employment in the forest sector	Montréal Process Ind.6.3.a, LFCC ind. 5-3-5
Employment rate in forest related communities	LFCC ind. 6-3-3
Labour productivity in forestry	Eurostat
Resilience of forest-dependent communities	Montréal Process Ind. 6.3.c
Production of renewable energy from forestry	CMEF context indicator
Energy use in agriculture, forestry and food industry	CMEF context indicator
Value of capital investment and annual expenditure in forest management, wood and non-wood forest product industries, forest based environmental services, recreation, and tourism	Montréal Process Ind. 6.2.a
Land take	LFCC ind. 2-2, EEA, CSI 014, http://www.eea.europa.eu/data-and-maps/indicators/land-take-2/assessment-2
Area and percent of forests available and/or managed for public recreation and tourism	Montréal Process Ind. 6.4.a, LFCC ind. 6-6-3

¹ Common Monitoring and Evaluation Framework Rural Development Indicators, http://ec.europa.eu/agriculture/sites/agriculture/files/rural-development-previous/2007-2013/docs/note_f_en.pdf

Environment & Biodiversity

Forest-related indicators could contribute to assess the implementation of the global CBD Aichi Targets to halt the loss of biodiversity and the degradation of ecosystem services and to restore them as far as feasible as well as to monitor related progress.

Non exhaustive list of possible indicators for a subset of forest-related environment/biodiversity indicators - Thought starter	Source
Tree species composition	FOREST EUROPE (4.1)
Regeneration	FOREST EUROPE (4.2), LFCC ind 1-2-6
Naturalness	FOREST EUROPE (4.3)
Introduced tree species	LFCC ind. 1-2-4, FOREST EUROPE (4.4), part of EEA SEBI 010 and CBD Ind.
Deadwood	FOREST EUROPE (4.5), EEA SEBI 018
Genetic resources	FOREST EUROPE (4.6), Montréal Process Ind. 1.3.c, LFCC ind. 1-3-1+2, ITTO ind. 5.5
Number of native forest associated species	Montréal Process Ind. 1.2.a, LFCC ind. 1-2-4
Fragmentation	Montréal Process Ind. 1.1.c, FOREST EUROPE (4.7), part of EEA SEBI 013 and CBD Ind.
Threatened forest species	FOREST EUROPE (4.8), Montréal Process Ind. 1.2.b, LFCC ind. 1-2-1, ITTO ind. 5.3, also part of CBD Ind.
Trends in abundance and distribution of selected species	EEA SEBI 001, CBD Ind., UNCCD Ind. So3-2, http://www.unccd.int/en/programmes/Science/Monitoring-Assessment/Pages/Impact-Indicators.aspx
Number of threatened forest biotope types	Proposal from FOREST EUROPE Goals and 2020 Target Report (could also be added under Ind. 4.8)
Protected forests	Montréal Process Ind. 1.1.b, LFCC ind. 2-9, ITTO ind. 5.1, FOREST EUROPE (4.9), also part of EEA SEBI 007, CBD Ind., SDG 15.2.1 Ind.
Natura 2000 forest area	<i>DG Env</i> http://ec.europa.eu/environment/nature/natura2000/index_en.htm EEA SEBI 008 (Sites designated under the EU Habitats and Birds Directives)
Ecological Footprint	EEA, SEBI 023, http://www.eea.europa.eu/data-and-maps/indicators/ecological-footprint-of-european-countries/ecological-footprint-of-european-countries-2 , AICHI Ind., CBD Ind.
Red List Index	EEA SEBI 002, IUCN, AICHI Ind.
Mountain Green Cover Index	FAO, SDG 15.4 Ind, AICHI Ind.

Resilience

Plant health and ecosystem resilience are key factors for sustainable forest management and are also important for the protection of biodiversity and ecosystem services.

Degraded forest areas and particularly desertification is increasingly becoming an issue also in the northern hemisphere, which can so far not be reported and expressed based on forest-related indicators.

Non exhaustive list of possible indicators for a subset of forest-related <u>resilience</u> indicators - Thought starter	Source
Deposition of air pollutants	FOREST EUROPE (2.1)
Soil condition	FOREST EUROPE (2.2)
Soil degradation	Montréal Process Ind. 4.2.b
Forest condition	ITTO ind. 2.7
Defoliation	FOREST EUROPE (2.3)
Forest damage	FOREST EUROPE (2.4), Montréal Process Ind. 3.a+b
Threats to forests caused directly by human activities	ITTO ind. 3.1
Vulnerability of forests to natural disturbances	ITTO ind. 3.2
Forest resilience and climate change adaptation	ITTO ind. 3.3
Forest degradation	FOREST EUROPE (2.5), LFCC ind. 1-1-4, ITTO ind. 3.4, part of SDG 15.3 ind.
Rehabilitation / Forest land restored	LFCC ind. 2-12, ITTO ind. 3.5
Introduces tree species	FOREST EUROPE (4.4)
Genetic resources	FOREST EUROPE (4.6)
Damages from weather and climate-related events	EEA CLIM 039
Exposure to forest fires	Proposal from FOREST EUROPE Goals and 2020 Target Report
Trends in land cover	UNCCD Ind SO2-1, http://www.unccd.int/en/programmes/Science/Monitoring-Assessment/Pages/Impact-Indicators.aspx SDG 15.2.1 Ind. (Forest area net change rate)

Climate change mitigation and adaptation

Global climate change could have significant impacts on the structure, distribution, productivity and health of forests as well as impacts on forest carbon stocks and fluxes, and the prevalence of forest damages. In the context of UNFCCC and concerning national GHG emission reduction targets, forest-related indicators could display the important contribution of the forest sector to climate change mitigation and adaptation efforts.

Non exhaustive list of possible indicators for a subset of forest-related <u>climate change mitigation and adaptation</u> indicators - Thought starter	Source
Growing Stock	FOREST EUROPE (1.2), Montréal Process Ind. 2.b
Carbon stock	FOREST EUROPE (1.4), Montréal Process Ind. 5a+b, LFCC ind. 4-1, ITTO ind. 2.8+4,4 also AICHI Ind. and UNCCD Ind SO3-1, http://www.unccd.int/en/programmes/Science/Monitoring-Assessment/Pages/Impact-Indicators.aspx Reports of GHG inventories from Countries to UNFCCC/ Kyoto Protocol
Avoided fossil fuel carbon emissions by using forest biomass for energy	Montréal Process Ind. 5.c
Greenhouse gas balance (emissions and sequestration)	EEA GHG emission database http://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer IPCC, ICP Forest, UNECE/FAO
Naturalness	FOREST EUROPE (4.3)
Introduced tree species	FOREST EUROPE (4.4)
Forest resilience and climate change adaptation	ITTO ind. 3.3
Wood consumption	FOREST EUROPE (6.7), Montréal Process Ind. 6.1.d
Energy from wood resources	FOREST EUROPE (6.9)
Electricity generated from renewable (wood) sources	Eurostat Tsien 050
Share of (wood) renewables in gross final energy consumption	Eurostat SDI & EEA, ENER 028
Recovery or recycling of forest products as a percent of total forest products consumption	Montréal Process Ind. 6.1.i
Public financial support and investments for forest adaptation	Proposal from FOREST EUROPE Goals and 2020 Target Report
Forest Land Footprint	Footprintnetwork.org
Forest composition and distribution	EEA, CLIM 034, http://www.eea.europa.eu/data-and-maps/indicators/forest-growth-2/assessment

Forests and water

Forest and water are two important ecosystems and land cover types that influence European history and socio-economic developments. European forests provide more than 4 km³ of water annually to the European citizens by means of hosting 870.000 km of rivers (the total length of European rivers is about 3.5 million km) and almost 33% of 71 000 lakes with total area of 92 000 km² are located in forested catchments.

Forests play a vital role in sustaining water resources, maintain water quality and regulate water flows. At the same time forests and woodlands depend on water sources. The way we manage our forests is key to the quality of the water we drink, to protect us from natural hazards and to ensure the productivity of our lands. As global demand for freshwater rises and water gets scarcer it becomes more important than ever to maintain functioning ecosystems which can provide services.

Absorption of water via percolation and transpiration are main forest roles in hydrology which have been analysed by a vast number of studies since decades. Recently this role of forests is regarded as one of the important ecosystem services which can be benefited in tackling with climate change adaptation, flood prevention as well as provision of clean water.

Non exhaustive list of possible indicators for a subset of <u>forest-and water</u> indicators - Thought starter	Source
Water retention by forests	EEA water account database
Soil water content	FAO, http://www.fao.org/docrep/r4082e/r4082e03.htm
Impact of forest management and harvesting on the small water systems, lakes and rivers/groundwater and on the nutrient balance of soil	Kit Prins, partly Eurostat, FAO Aquastat
Protective forests – soil, water and other ecosystem functions	FOREST EUROPE Ind. 5.1
Soil erosion by water – area eroded by more than 10 t/ha/year	Eurostat - Part of EU Resource Efficiency Scoreboard

Energy

Solid and gaseous biomass – particularly wood and wood waste used for electricity, heating and cooling are huge sources of renewable energy.

In order to meet growing forest biomass demand for energy and other uses, forest production will need to be intensified and will be dependent on imports of woody biomass in some countries. If done unsustainably, this could lead to forest degradation, with consequent negative impacts on biodiversity and ecosystem services, including on the carbon pool.

To measure the use of energy from renewable sources, forest-related indicators could facilitate related monitoring requests.

Non exhaustive list of possible indicators for a subset of forest-related <u>energy</u> indicators - Thought starter	Source
Relative share of wood energy sources	Joint Wood Energy Enquiry (JWEE) http://www.unece.org/forests/jwee.html
Relative share of wood energy uses	JWEE
Share of woody biomass	JWEE, SDG 15.2.1 Ind. (Above-ground biomass stock in forest)
Share of energy use in calculated domestic consumption of woody biomass	JWEE
Share of imports in wood fuel supply	JWEE
Trade in wood	FOREST EUROPE (6.8), Montreal Process ind. 6.1.h, LFCC ind. 5-1-3
Energy from wood resources	FOREST EUROPE (6.9)
Electricity generated from renewable [wood] sources	Eurostat Tsien 050
Share of [wood] renewables in gross final energy consumption	Eurostat SDI & EEA, ENER 028 http://www.eea.europa.eu/data-and-aps/indicators/#c5=&c7=all&c0=10&b_start=0
Availability and use of [woody] biomass resources for energy purposes	EU Renewable Energy Directive, Article 22 reporting, http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32009L0028&from=en
Changes in commodity prices and land use within the EU Member State associated with its increased use of [woody] biomass and other forms of energy from [woody] renewable sources	EU Renewable Energy Directive, Article 22 reporting
Development and share of biofuels made from [woody] wastes, [woody] residues, non-food cellulosic material, and ligno-cellulosic material;	EU Renewable Energy Directive, Article 22 reporting
Estimated impact of the production of biofuels and bioliquids on biodiversity, water resources, water quality and soil quality within the Member State;	EU Renewable Energy Directive, Article 22 reporting
Estimated net greenhouse gas emission saving due to the use of energy from renewable sources	EU Renewable Energy Directive, Article 22 reporting

Bioeconomy

The forest-based sector plays a central role in a bioeconomy as it provides material, bioenergy, ecosystem services among others. All provisions and demands need to be properly balanced to secure a sustainable forest management. Related indicators can help to avoid unwanted impacts, and support successful and sustainable bioeconomy development.

Non exhaustive list of possible indicators for a subset of forest-related <u>bioeconomy</u> indicators - Thought starter	Source
Resource use [wood] -Primary production of [woody] biomass -Import of [woody] biomass -Global land use for [woody] biomass based consumption	Montréal Process ind. 2.d and 6.1.f COMEXT data, used for JFSQ, EUROSTAT, FAO AGMEMOD database, UNCOMTRADE database EFI Forest Products Trade Flow Database
Resource productivity -Ratio between gross domestic product (GDP) and domestic material consumption (DMC)	LFCC ind. 5-3-4, ITTO ind. 7.1 Eurostat SDI Headline Ind <small>tsdpc100 http://ec.europa.eu/eurostat/cache/metadata/DE/tsdpc100_esmsip.htm</small> Also lead indicator in the EU Resource Efficiency Scoreboard. Data so far not specific for the forest sector
Resource and materials efficiency -material and waste recycling and recovery rates -materials leaving the economy (landfill, incineration without energy recovery) -Renewable energy -Water re-use and recycling	OECD Green Growth ind. Montréal Process ind. 6.1.i
Water footprint -of wood products including water embodied in imports and exports	http://waterfootprint.org/
Natural resources index [of timber resources] -use intensity -depletion rates	OECD, ^o http://www.oecd.org/greengrowth/06%20NATURAL_RESOURCE_INDEX_VAN%20DE%20VEN%20pptx.pdf
Share of renewable [wood based] energy in gross final energy consumption	Part of the EU Resource Efficiency Scoreboard EEA, t2020_31 http://www.eea.europa.eu/data-and-maps/indicators/renewable-gross-final-energy-consumption-4/assessment FAOSTAT, Joint Wood Energy Enquiry Eurostat, ^o http://ec.europa.eu/eurostat/cache/metadata/en/t2020_31_esmsip.htm
Indirect land use/embodied land for agriculture and forestry products	Giljum et al. 2013
Red List Index of threatened species	IUCN; SDG ind. 15.5.1, AICHI Ind.
Carbon footprint of the forest and harvested wood chain (carbon stock changes)	Global Footprint Network, IPCC LULUCF/ AFOLU databases of “emission factors” Reports of GHG inventories from Countries to UNFCCC/ Kyoto Protocol (carbon stocks changes in biomass and soils; also carbon stock and stock changes from HWP), Eurostat

Greenhouse gas balance (emissions and sequestration) 1) GHG emissions in total FWC and by sub-sectors classified by -energy use (in non-industrial processes) -industrial processes -waste 2) Carbon sequestration in total FWC and by sub-sector on average for the reference year averaged over a period of 5 years classified by: -living woody biomass above and below ground, dead wood and in soils of forests -harvested wood products -GHG balance in total FWC and by sub-sector	EEA GHG emission database http://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer IPCC ICP Forest UNECE/FAO
Employment in forest-based bioeconomy sectors, and contribution to regional employment	Eurostat, GTAP database, LABOURSTA of ILO
Eco-innovation index	Eurostat, EU Innovation survey, Resource Efficiency Scoreboard

Subsets of key or headline indicators

Subset of the pan-European indicators for SFM

The idea of a sub-set of key indicators was thought to be relevant, in particular for communication purposes during the FOREST EUROPE indicator improvement process in 2014/15 and was discussed as well within the Standing Forestry Committee ad hoc Working Group on sustainable forest management criteria and indicators (EC, 2015).

Having a list of key indicators, does not imply that the whole set of indicators should not be used and reported on. A simplified set has the advantage of simplicity in being able to explain and communicate the concept of SFM to the public at large.

Based on the inputs from EU Member States and stakeholders and taking into account the need to address in a balanced way the three pillars of SFM the following key indicators (out of the set of FOREST EUROPE indicators) were proposed to be used for communication purposes (EC, 2015):

HORIZONTAL (ec-env-soc)	<ul style="list-style-type: none"> - Forest area - Growing stock - Increment and fellings - Forests under management plan or equivalent instruments - Protective forests
ENVIRONMENTAL	<ul style="list-style-type: none"> - Forest damage - Carbon stock - Protected forests - Deadwood - Tree species composition
SOCIO-ECONOMIC	<ul style="list-style-type: none"> - Net revenue - Workforce - Bioenergy production - Wood consumption - Trade in wood

Global subset of indicators for SFM

Also on global level, there is an ongoing discussion on key forest indicators. An Organization-led Initiative (OLI) on the development of global forest indicators to support the implementation of the 2030 Agenda on Sustainable Development and the International Arrangement on Forests (IAF) Strategic Plan took place in Rome from 28 to 30 November 2016².

The participants considered that a global core set of forest-related indicators, covering indicators for sustainable forest management, indicators for progress towards the forest related SDGs, targets and other internationally agreed goals on forests, and other indicators relevant for the IAF Strategic Plan could be instrumental in streamlining reporting on forests and decreasing the reporting burden on countries. Such a global core set should address information needs of global forest related processes in a balanced way across the different sustainability dimensions, and include governance aspects addressing major forest-related issues. Participants reviewed a proposed core set of 21 indicators. The classification agreed is as follows:

GREEN: Concept and data availability broadly satisfactory, although some issues may exist, and are reflected below. Definitely maintain in the list, possibly with minor modifications.

YELLOW: More work is needed on concepts, definition or methodology. May be converted to Green or Red

RED: Remove from the core set.

Note: indicators in ***bold italic*** are those included in the proposed indicators/sub-indicators to be used for **SDG 15.2.1**, as put before the Inter-Agency Expert Group on SDG indicators (IAEG) in November 2016. These will be modified, as requested by the IAEG.

Indicator	Classification	Issues raised at OLI
<i>Forest area net change rate (%/year)</i>	GREEN	
<i>Proportion of forest area located within legally established protected areas (%)</i>	GREEN	Other protection than “legally” should be considered, perhaps referring to the IUCN Protected Area categories
<i>Above-ground biomass stock in forest (tonnes/ha)</i>	GREEN	Overharvesting/degradation/damage will result in reduced biomass/ha, so this is a powerful sustainability indicator In some cases higher biomass/ha may be negative (increased fuel load for fires)
<i>Above-ground biomass stock in forest (tonnes/ha)</i>	GREEN	Overharvesting/degradation/damage will result in reduced biomass/ha, so this is a powerful sustainability indicator In some cases higher biomass/ha may be negative (increased fuel load for fires)
<i>Proportion of forest area under a long term forest management plan (%)</i>	GREEN	Governance indicator. Concept already used in FRA 2015
Existence of policies supporting sustainable forest management, including formal protection of existing forest, or definition of a permanent forest estate in countries where this is necessary, with the institutions and resources necessary to implement these policies	GREEN	Governance indicator. Concepts already used in FRA 2015 Reword for increased clarity and concision

² <http://www.cpfweb.org/45490-0d71a5912f12057f07cada2389889b88.pdf>

Existence of a recent, scientifically sound, national forest inventory	GREEN	Governance indicator. Concept already used in FRA 2015
Existence of a national multi-stakeholder policy platform, with active participation of civil society, indigenous peoples and the private sector	GREEN	Governance indicator. Concept already used in FRA 2015
Percentage change in official development assistance for sustainable forest management	GREEN	Included in GOFs Data available
Carbon stocks and carbon stock changes in forest land: net forest GHG sink/source of forests, forest carbon stock, carbon storage in harvested wood products (Tons C)	GREEN	Too many elements in indicator. Needs better focus to clarify significance
Forest health and vitality: % of forest area disturbed	YELLOW	Difficult to combine data on different types of disturbance Define list of types of disturbance Exclude harvesting Differentiate from 12 on degraded forest
Protective functions of forest resources: Mountain Green Cover Index (forest component) OR Forest area designated and managed for protection of soil and water	YELLOW	Only indicator addressing protective functions of forests (thematic element) MGCI does not address protective functions of forests outside mountain areas Multiple functions make it hard to identify forests "designated"
Number of forest related jobs per 1000 ha of forest	YELLOW	Should be at least one socioeconomic indicator on jobs. Significance of changes in this indicator not clear (productivity v. job creation) Denominator (ha of forest) not appropriate Explore ideas of parity, revenue, fatalities
Forest area under an independently verified forest management certification scheme (ha)	YELLOW	Concept already used in FRA 2015 Concern in IAEG that certification not an official policy instrument Not all sustainably managed forest is certified – indicator could lead to misunderstanding
Percentage change in area of degraded forest	YELLOW	Included in GOFs Problems defining and measuring forest degradation Differentiate from 3 on disturbance
Percentage change in the number of forest dependent people OR Livelihoods of forest dependent people	YELLOW	Included in GOFs Problems in defining/measuring "forest dependent" people, "livelihoods" Significance for sustainability of the indicator?
Financial resources from all sources (except ODA) for the implementation of sustainable forest management (\$/ha of forest)	YELLOW	Included in GOFs Need to define "all sources" (include revenue from forest management, private investment, public budgets etc.)
Volume of wood harvested per 1000 forest workers (m ³ /1000 workers)	YELLOW	Addresses efficiency in use of factors of production (green economy). Significance (workers more productive in developed countries, because of capital)? Informal workers?

Share of wood based energy in total primary energy consumption, of which in modern clean systems (%)	YELLOW	Significance not fully clear (traditional wood energy v. clean wood-based renewable energy)
Proportion of traded/consumed forest products derived from illegal logging or trade (%) OR Existence of a robust system to track sustainably produced forest products	YELLOW	Topic important, necessary to monitor success of new policy instruments. Measurement of illegal activity clearly challenging
Value of payments for ecosystem services (PES) related to forests (value of payments, as ratio to total forest area or area of forest covered by such PES)	YELLOW	Concepts not yet defined Measurement problems, especially for small PES schemes Better to use value rather than number of schemes.
Recovery rates for paper and solid wood products (volume recovered for re-use as % of volume consumed)	RED	Considered outside scope of SFM, as not subject to SFM policy instruments

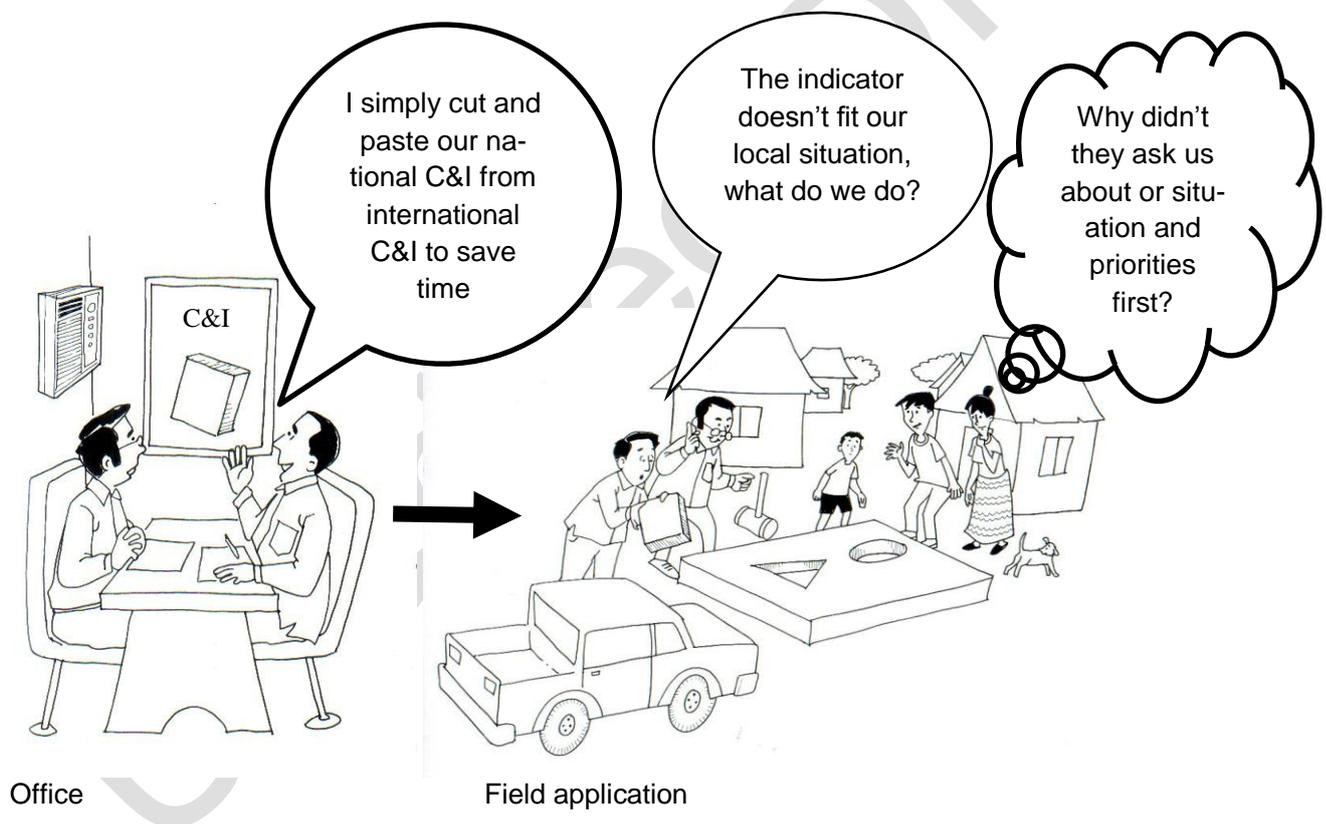
Unedited Draft

Annex 3:

Toolbox of methods to assist in the development process of national C&I

3.1 Background and rationale

There is general agreement in international practice that national C&I should be developed in a top down/bottom up process, that means to align national criteria and indicators with international C&I, but to make sure that national C&I, particularly indicators, grow from and reflect local characteristics and the interests of national and local stakeholders. Rametsteiner et al. (2011) highlight that the decision of “who participates and decides” during the indicator development process is more important than the technical aspects on how to develop them. Balanced representation among all key forest stakeholders is essential, as this ensures the indicators reflect the realities, interests and aspirations of a range of stakeholders. Engaging stakeholders in indicator development and testing not only builds the relevance but also builds ownership and buy-in, which ensures more acceptance and support during the implementation of the indicators. A few weeks or months of engaging stakeholders in the process of developing and testing indicators may seem like an unnecessary luxury but can avoid numerous problems in the years ahead of indicator implementation.



Key forest stakeholders are those affected by, influential on, or with expertise relevant to forestry. As well as those inside the forest sector, this may include those outside the forest sector but who have a direct influence on it or are directly affected by it. Stakeholders may be a formal group or organisation or an informal grouping. There are many different levels of stakeholders and stakeholders within stakeholder groups. When identifying and engaging stakeholders often a balance has to be struck between comprehensive stakeholder engagement of all stakeholders and what can be practically achieved within time and resources. The priority should be engaging a good mix of highly affected stakeholders, such as forest dependent people, and highly influential people, such as senior deci-

sion makers. A good mix of government, NGO, private sector operating at national and local level along with community representatives would be ideal. Also, it is important to try to aim for a balance of social, economic and ecological interests in the stakeholder composition. Tool number 1 in the toolbox, stakeholder mapping is designed to help identify the range of stakeholders that should be engaged.

Secondly, it is important to consider a representative sample of stakeholders and sites through categorisation of the forest sector. This has been done in different ways; the most common way is to stratify the forests according to forest types, then ensuring that there is stakeholder representation from each of those forest types. In other examples forests have been stratified according to ownership or management regime or what the forests produce. The categorization should be decided based on what works best for the country context.

Where stakeholders have formal representatives, it is relatively easy to engage them, where on the other hand they are informal groups, such as forest dependent communities or people working with small forest enterprises, often arrangements have to be made to hold focus group discussions and interviews with these people. Many of the tools in the tool box can be useful to structure the analysis of groups and to help ensure that there is good engagement from the group. As well as separate meetings with different stakeholder groups, multi-stakeholder meetings enable negotiation between stakeholders and building common understanding. Getting all stakeholders to compromise and agree on indicators during their development will avoid conflicts during implementation. There are tools in this tool box that help manage such multi-stakeholder meetings and help reach consensus on the priority indicators.

The following tool box provides methods to help coordinators and facilitators of national C&I development process to identify stakeholders, engage them in analysis, assist in facilitating multi-stakeholder negotiation and in conducting multi-stakeholder prioritisation. Also, there are tools to help with consultative validation of drafts of the criteria and indicators.

The role of the facilitator and coordinator of national C&I development in these engagements with stakeholders is to play a neutral role, clearly explaining the purpose of national Criteria and Indicators, then guiding the interaction to enable the stakeholders to determine their own decisions on what indicators are important for them. The facilitators should try not to influence the outcomes with their own biases or preferences.

3.2 Toolbox of methods for stakeholder engagement in national C&I development

The following tool box of methods is arranged according to different potential uses in the bottom up aspects of national criteria and indicator development processes. Note that tools are described generically and should be adapted to specific context or purpose. Also all tools are optional, some may fit the context, some may not, and some may need to be adapted after testing them. The sequence is only a suggestion.

Phase of the national C&I development process	Tool/method	Potential purpose for stakeholder engagement national C&I development
Planning the stakeholder engagement	1. Stakeholder mapping	Identifying all key stakeholders and then developing a plan and methods to engage them
Engaging stakeholders in analysis leading to identification of their priorities for indicators	2. Questionnaires/interviews	Way to structure the questioning of a respondent. Can be used to gather information via internet, phone or face to face. Works best with individuals.
	3. Visioning	Can be used to assess expectations/aspirations with regards to goals and outcomes for sustainable forest management. Defining the goal makes it easier to determine the criteria and indicators that feed into the goal.
	4. Problem and solution analysis	To help a group of people organize their thoughts around the causes of any problems with sustainable forest management, interlinkages between the causes, and finally root causes. Identifying how to tackle root causes of problems leads to strategies that can make a fundamental positive contribution to sustainable forest management. Indicators can then be based on the expected outcomes of these strategies.
	5. Strengths, Weaknesses. Opportunities and Threats analysis. Or a simplified version Strengths, Weaknesses and Recommendations	Whereas the problem analysis goes deep, this analysis tool goes broad, harnessing analysis from positive and negative aspects identifying immediate strengths and weaknesses related to forestry, as well as more external opportunities and threats in the governance environment. Recommendations are then drawn from the analysis and indicators defined for the expected outcomes of the recommendations.
	6. Scoring and prioritisation	It is often difficult particularly in a group to decide on priorities, these

Phase of the national C&I development process	Tool/method	Potential purpose for stakeholder engagement national C&I development
	tion methods	tools are to help with this. Once indicators have been identified then these methods enable collective ranking and screening of the indicators according to parameters. This is also a useful method when a pre-determined set of indicators is to be assessed.
	7. Fishbowl debate	Often it is very useful to bring representatives from the previous stakeholder engagement exercises together to present their indicators and supporting analysis to each other. This method helps to 'level the playing field' among different stakeholders providing all an equal opportunity to be heard and avoid domination.
	8. Scoring or priority ranking (modified to multi-stakeholder setting)- see tool 6.	The same methods as in tool 6, but adapted this to time to a multi-stakeholder setting to find collective priorities on the indicators.
Drafting the national C&I	9. Analytical Hierarchy process – good guide to developing coherent C&I set.	This tool is a good way of organising all the previous information from the earlier steps in the process as well as from a review of international C&I (See Annex 1) into a coherent hierarchy from the goal, to themes/principles, and below them criteria and indicators. It helps to ensure all aspects of Sustainable Forest Management are covered and helps avoid overlap between indicators. It is usually best conducted with a relatively small group, usually the coordination team themselves, and helps them structure all the information they have already gathered.
Validation/Consultation on the draft	10. Poster presentations with post-its	This method is ideal for a participatory review of a draft set of criteria and indicators, allowing participants to comment on the document directly.
	11. Multi-stakeholder panel	This method is useful to allow stakeholder representatives to give their feedback on a presentation of draft set of Criteria and Indicators, helping verify that an inclusive process was followed and that the final output takes into consideration the interests of key stakeholders.

Tool 1: Stakeholder identification and mapping

Purpose: Stakeholder mapping is a useful tool to identify potential key stakeholders to engage in the process of national C&I development and identify how to engage them practically in the process.

Procedure:

Step 1: Identify categories of typical forest-related stakeholders and place names of stakeholders on separate cards. A forest-related stakeholder is any category of people, formal organisation or informal group that is either dependent on, have expertise on, influences or is affected by forest-related decision making and action. Make a list of three stakeholder groups: 1) highly dependent on the forest (e.g. forest communities), 2) experts (e.g. forest engineers, scientists, and statisticians), and 3) highly influential groups (e.g. forest owner associations, NGOs, etc) and add for each information on (a) *Why should this group be involved in the development of national C&I?*

Step 2: Within each of the three groups consider for each stakeholder “how dependent or affected the stakeholders are on the forest resources” (y-axis) and “their level of influence over decisions on forests and forestry at a national level” (x-axis) and discuss where the stakeholders fit in the matrix – based on the current situation in your country.

Step 3: Within each of the three groups discuss where stakeholders should ideally be in the matrix in terms of influencing the national C&I development. Add arrows to show the ‘ideal’ position of the stakeholders in the process of national C&I development.

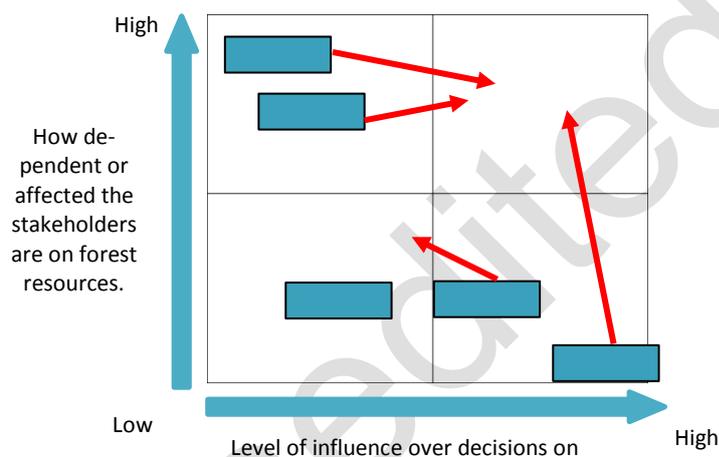


Figure: Example for Step 2 and 3 of the stakeholder mapping.

Step 4: Identify ways to engage these stakeholders, for example through focus group discussions, interviews or stakeholder meetings using the other tools in this tool box. It is important to tailor engagement methods to the stakeholder group.



Photo: Stakeholder mapping, step 2.

Tool 2: Questionnaires/ interviews

Purpose: Way to structure the questioning of a respondent. Can be used to gather information via internet, phone or face to face. Works best with individuals.

Procedure:

One of the most used and often misused tools in the box, it is important to think carefully about the questions so they are open and not leading questions. For example, a leading question on C&I development would be *'Low environmental awareness is a key problem among rural people that leads to unsustainable forest management, what indicators would you propose to measure increased environmental awareness?'* The problem and blame is already assumed in the question. A more open question would be *'What factors are important to ensure sustainable forest management?'*

Questions that begin with 'Why' are particularly relevant for participatory approaches. 'Why' questions are effective in illuminating the viewpoint and justifications from the respondents' perspective – stepping 'into their shoes'. Many questions often work best in sets, a sequence of questions. Some sets of questions that may be useful for national C&I development are;

- Why are forests important to you? What are the most important contribution of forests to you? What would be a good practical indicator to measure these contributions?
- Why are either negative or positive changes happening in forestry? Please come up with recommendations to address the negative aspects, or build on the positive aspects? What indicators would be useful to measure progress towards achieving these recommendations?
- (From above) What factors, both immediate and underlying are important to ensure sustainable forest management? What indicators would be useful to measure whether these factors are successfully in place?
- What are achievable positive social, economic and ecological outcomes from sustainable forest management if the potential is released? What indicators would be appropriate to describe these outcomes?

Advice on this method: When conducting semi-structured interviews, it is important to make people as relaxed as possible. It is therefore helpful to have small talk first and to not rush into questions. As with all methods, explain the purpose of the semi-structured interview very carefully and explain what the information will be used for. Participants should be asked if they would like to remain anonymous or not. At the end of the exercise the note taker must read out his/her notes for verification by

the participants present and change them accordingly. Also ask respondents if there is anything important they would like to add that fell outside what the questions asked for.

Tool 3: Visioning

Purpose: Before having participants think about criteria and indicators for sustainable forest management, it is often useful for them to visualize what their goal is for sustainable forest management. Different stakeholders will have different goals. For the facilitators, understanding the goal of a particular stakeholder group will help to understand the subsequent indicators they propose.

Procedure: Ask participants on a piece of paper to visualize what their vision of sustainable forest management is. It is often good to do this initial vision without words to get behind any jargons to what people actually mean. Once the vision is drawn, based on observations different questions can be asked. It is often useful to observe whether a balance of social, environment and economic aspects of forestry are considered in the vision. Once the vision is drawn, participants can be asked what indicators could be formulated to describe the elements in the vision. Or it could be asked what barriers are in the way of reaching this vision. This leads on nicely to the next method, the problem analysis.

Tool 4: Problem and solution analysis

Purpose: To help a group of people organize their thoughts around the causes of any problems with sustainable forest management, interlinkages between the causes, and finally root causes. Identifying how to tackle root causes of problems leads to strategies that can make a fundamental positive contribution to sustainable forest management. Indicators can then be based on how on the expected outcomes of these strategies.

Procedure:

1. Although problems can also be defined by participants, sometimes it is easier and more useful to have a general problem identified which should capture most of the issues. For example 'Sustainable Forest Management potential not fully realized'
2. Discuss and decide what the reasons are for the problem identified, write reasons on cards and place below the problem. Below this can also be placed themes, as seen in the diagram that follows to encourage participants to
3. Collectively arrange cards so that cause-cause linkages are in proper sequence, more immediate causes are closer to the problem and more underlying causes are further down. Higher cards are always consequences of those below. Group similar cards and label groupings.
4. Try to identify also the deep root causes of the problem ('why?') and place them below the causes of the problems.
5. More on to the effects, in a similar process to the causes, list the effects of the problem and identify interlinkages between the effects.
6. The next step of this method is the solution analysis. Start with solutions to the root causes and then work up through the other causes towards the problem, which should be reformulated as a positive e.g. 'Sustainable Forest Management potential fully realized'. Then move on to the effects, they should also be reversed into positive consequences now.

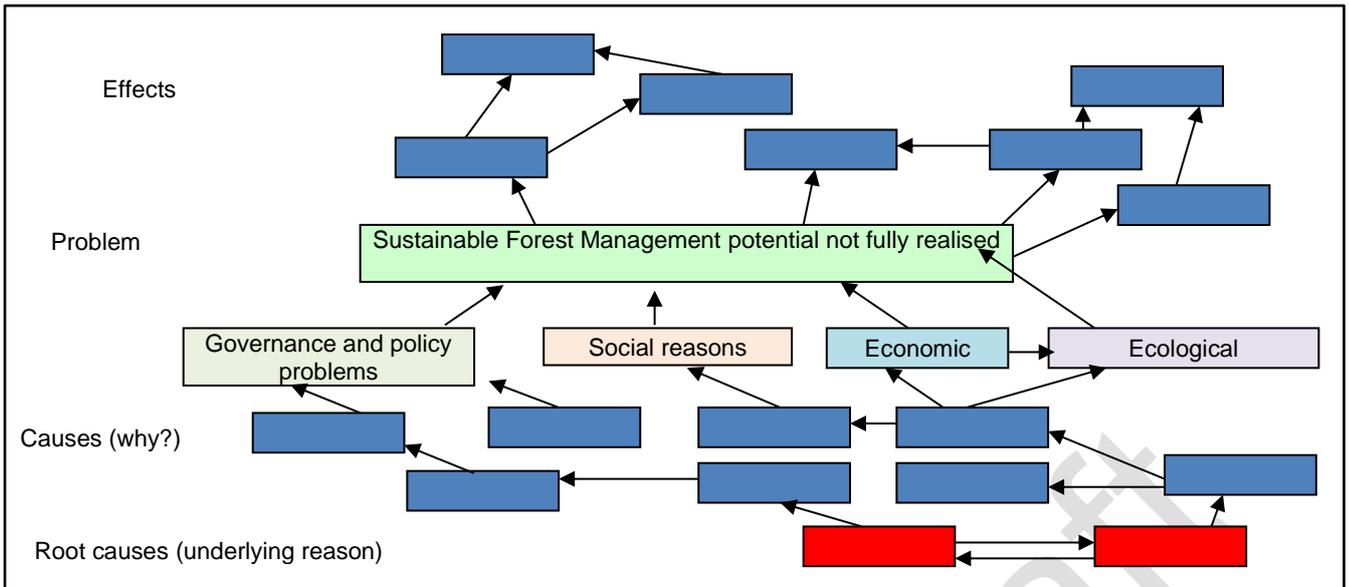


Figure: Example structure for the problem analysis.

- In this exercise, the indicators can be derived from two parts of the exercises, indicators that describe the effects, and indicators that describe the outcome of the solution that addressed the causes of the problem. The most important indicators with regards to transformation of the forest sector will be those associated with the root cause addressing solutions. For example if the underlying cause is identified as unclear forest tenure and use rights, with the solution being to strengthen forest tenure and use rights, then the indicator would be something like 'Clear legal backing for forest tenure and use rights'.



Photo: Problem and solution analysis.

Tool 5: Strengths, Weaknesses, Opportunities, Threats (SWOT) analysis

Purpose: Whereas the problem analysis goes deep, this analysis tool goes broad, harnessing analysis from positive and negative aspects identifying immediate strengths and weaknesses related to forestry, as well as more external opportunities and threats in the government environment. Then asking people to develop strategies based on the analysis, tackling weakness/threats.

Procedure:

Start with internal – what are the immediate strengths and weaknesses of the forest sector and how it affects you.

Then list external – in the enabling environment (policies, markets, supply etc.) – opportunities and threats.

INTERNAL – immediate strengths and weaknesses of the forestry that affect you.		EXTERNAL In the enabling environment factors that affect forestry, e.g. government policies, market, etc.	
Strengths +	Weaknesses -	Opportunities +	Threats -
[]	[]	[]	[]
[]	[]	[]	[]
Practical recommendations that build on strengths and address weaknesses:		Practical recommendations that build on opportunities and address threats:	
[]	[]	[]	[]
Feasible and measurable indicators to assess progress towards recommendations:		Feasible and measurable indicators to assess progress towards recommendations:	
[]	[]	[]	[]

Figure: Example structure of the SWOT analysis.

1. Based on both the strengths, weaknesses and opportunities and threats develop recommendations that either address the negatives or build on the positives.
2. Finally develop indicators, which describe expected outcomes, if the recommendations were implemented.



Photo: SWOT analysis.

Advice: Don't get too caught up in discussions on what is external and internal as there is overlap.

Note that a simpler alternative is the Strength, Weakness, Recommendations/Indicators method. See frame that follows. It is easy to apply this method to different forest types, see first column.

Type/Category of forest	Strengths	Weaknesses	Recommendations (building on strengths and/or tackling weaknesses).	Indicators that can measure progress expected outcomes from the recommendations.



Photo: Strengths, Weakness, Recommendations/Indicators method.

Tool 6: Scoring and prioritisation methods

Purpose: Some of the indicators developed by this stage in the process may not be widely supported, whereas others may be. So it is important to get an idea of where priorities lie. It is often difficult particularly in a group to decide on priorities, these tools are to help with this. Once indicators have been identified then these methods enable collective ranking and screening of the indicators. This is also a useful method when the relevance of a pre-determined set of indicators is to be tested. This is a useful way to screen indicators in terms of their importance, if there is a large number of indicators, this may help get the numbers down to a manageable amount.

Procedure:

There are numerous methods that are used to help participants score or prioritise indicators. In the following is described two basic examples.

Scoring exercises involve an indicator being judged on its own merit, for example on a scale of 5 to 1, with 5 being extremely important, 4 being very important, 3 being moderately important, 2 being not very important and 1 being irrelevant. Often participants are asked to score against different parameters, as in the table below. In the table below when the totals are added up horizontally, the top preference gets the highest score.

Indicators	Score against importance and relevant. 5 to 1	Score against feasibility and practicality 5 to 1	Score against clarity 5 to 1	Total score	Final order of preference
A					
B					
C					
D					

The second type of tools are priority ranking tools, there are whether indicators are assessed against each other. So you rank them in order of how best they match the parameter compared to the others. In the example below there are 4 criterion, so the top ranking criterion will be given a score of 4 (the highest priority gets the highest number not the lowest), the next 3, the next 2 and the next 1. When the totals are added up horizontally, the top preference gets the highest score. See table below.

Indicators	Pick importance and relevant. 5 to 1	Score against feasibility and practicality 5 to 1	Score against clarity 5 to 1	Total score	Final order of preference
A					
B					
C					
D					

Advice: For ranking methods to work well, the indicators that are to be prioritised have to be clearly differentiated from each other. So it is important to group similar meaning indicators together before the start of the ranking exercise, otherwise you can ‘split the vote’ on two similar indicators.

Scoring tends to be the easiest to explain and to do when there is a large group of people, however ranking tends to get people to think harder as they have to compare criterion. With ranking however mistakes can easily be made, especially in a large group and it only takes one person to misunderstand the ranking to invalidate the results.



Photo: A ranking exercise of indicators against different parameters in Mongolia

Tool 7: Fishbowl debate

Purpose: Often it is very useful to bring representatives from the previous stakeholder engagement exercises together to present their priorities to each other. This method helps to 'level the playing field' among different stakeholders providing all an equal opportunity to be heard and avoid domination.

Procedure:



Photo: Fishbowl debate method.

1. Set up the chairs as seen on the photo and explain the purpose and procedure of the exercise, often a demonstration is useful to show how the method works.
2. A representative from the first stakeholder group presents their indicators and justifies them (e.g. for 10 minutes), they then sit in the centre.
3. No one speaks on the outside ring, if you want to come in to critique or support the presentation you must come to the central chairs, the first person to arrive is the first to speak.
4. After commenting these respondents must return to outside circle – time limit for comment is 1 minute.
5. Presenter remains in centre and can respond at any time.
6. Once the facilitator 'closes' the debate, NO NEW people can come to the centre. Those in the middle can finish their comments.
7. The justifier may have final remarks at the end to try to convince people.
8. Then move on to the next stakeholder group to present. Try to allocated similar time for each stakeholder group in the debate.

Advice: The fishbowl debate is designed to promote discussion and listening, it does not in itself lead to an agreement as to the outcome of a discussion. For that a priority ranking or scoring exercise can be a useful conclusion that directly follows the fishbowl debate to bring the discussion to an outcome. The different indicators discussed in the fishbowl debate are transferred to a priority ranking/scoring exercise (for example see tool 8).

Tool 8: Priority ranking or scoring exercise adapted to multi-stakeholder setting

Procedure: The same method as in tool 6, but adapted in this case to a multi-stakeholder setting to find collective priorities on the indicators. Now each stakeholder group first agrees the score within its group, and then transfers the score to the matrix. A ranking method could also be used. The below is just an example with three stakeholder groups identified, there can be many more and of course many more indicators.

Note at this stage in the process it might be important to mix and combine but the 'bottom up' indicators developed through the stakeholder engagement exercises with the selected indicators from the international indicator lists in Annex 1. This combined list can then be score by the stakeholders.

Indicator	Forest dependent people. Score from 5 to 1	Government forestry department. Score from 5 to 1	Private sector. Score from 5 to 1.	Total score	Final collective order of preference
A					
B					
C					
D					

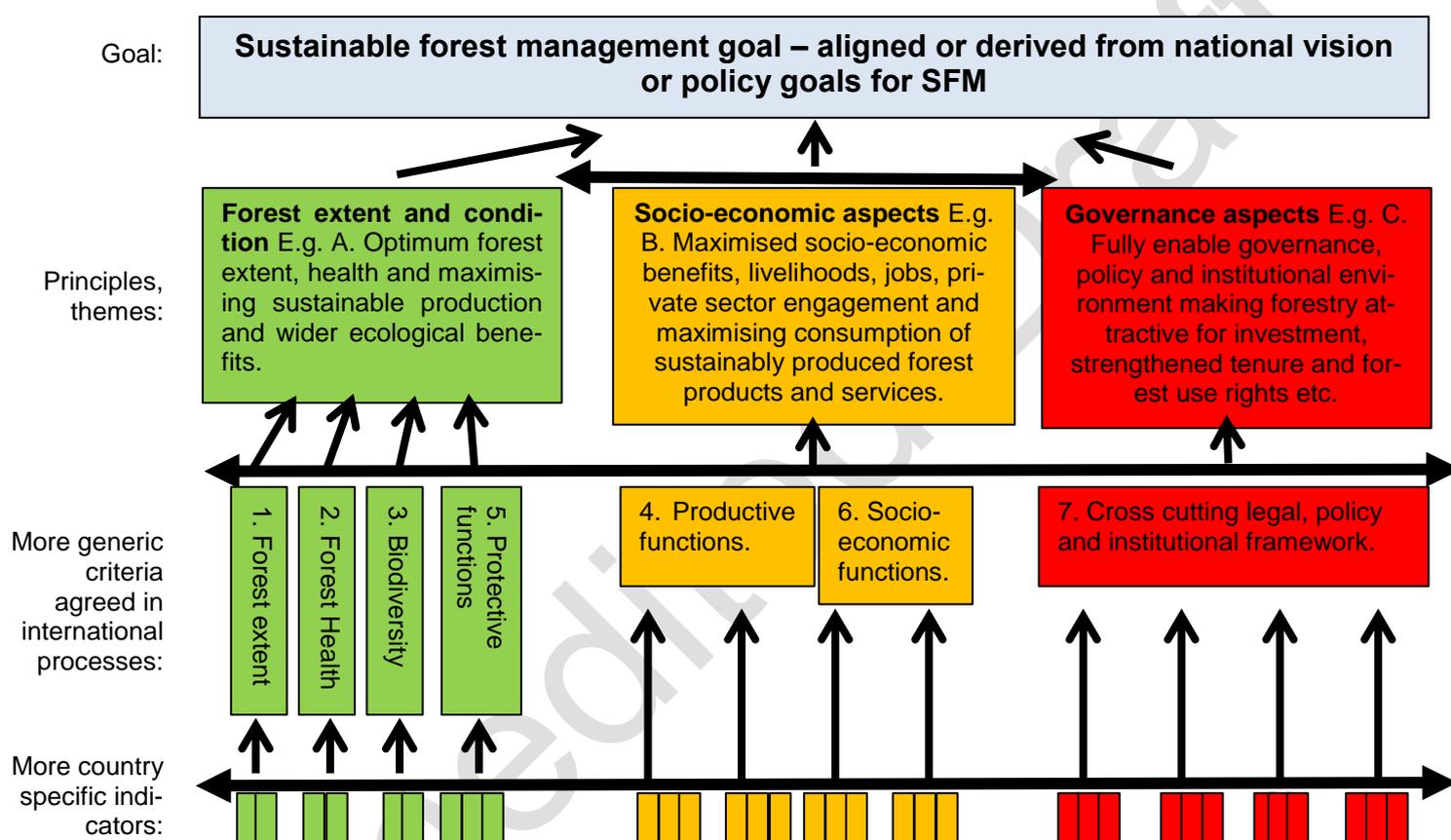
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Tool 9: Analytical Hierarchy Process – guide to developing coherent C&I set

Purpose: This tool is a good way of organising all the previous information from the earlier steps in the process into a coherent hierarchy from the goal, to themes/principles, and below them criteria and indicators. It helps to ensure all aspects of Sustainable Forest Management are covered and helps avoid overlap between indicators. It is usually best conducted with a relatively small group, key representatives from different stakeholder groups, experts and the facilitation team.

Procedure:

1. It is important to first remind people of the hierarchy again so they understand the logic. See figure that follows.



2. The following three frameworks based on the three themes in the above figure. They are designed help to guide the development of the hierarchy of indicators.
3. The following table should be repeated 3 times according to indicators that cover 1. Forest extent and condition, 2. Socio-economic aspects and 3. Governance aspects.
4. The criteria already stipulated in the tables are based on international criteria, and it is important that national indicators can be aligned to these criteria.
5. The matrix should be filled in from left to right, with what is expected listed in the headings.
6. If the participants filling the matrix are not at least 75% confident that the indicator can be measured (see last column), then they should go back and change the means of verification and/or the indicator itself until they identify an indicator and means of verification that is feasible and practical to measure. Half good indicators that are realistic to measure are better than perfect indicators that are unfeasible to measure!

Table 1. Criteria and Indicators related to forest extent and condition.

Good: Full potential of Sustainable Forest Management unleashed.



Principle/objective E.g. A. Optimum forest extent, health and maximising sustainable harvesting of products and wider ecological benefits.



<p>A. Criteria. Formulate as outcomes/results. Can be modified to national context but aim for some alignment with international criteria. Avoid overlap between criteria.</p>	<p>B. Indicators Must reflect national priorities. Indicators should be simple and clear, be a complementary mix of both quantitative and qualitative (try to have both kinds for each criteria). At national level the best indicators should be Specific, Measurable, Achievable, Realistic and Time-bound (SMART). Avoid overlap between indicators. Number indicators see below.</p>	<p>C. Means of Verification/measure. The clearly identified concrete source of information/record that verifiably demonstrate that the target is being achieved. (although not part of a final C&I set, very useful to ascertain feasibility)</p>	<p>D. Positive assumption of feasibility: Confidence greater than 75% that indicator – information to verify it can be practically and feasibly assessed, within normal government resources. If less than 75% revise the indicator to something more achievable.</p>
1. Forest extent	1.1, 1.2 etc.		
2. Forest health			
3. Biodiversity			
5. Protective functions			

Table 2. Repeat the same table as above but with a focus on, Criteria and Indicators related to socio economic aspects.

The principle above the table should state ‘Maximised socio-economic benefits, livelihoods, jobs, private sector engagement and maximising consumption of sustainable forestry products’

The criterion to be listed in the first column should be. 4. Productive functions and 6. Socio-economic functions.

Table 3. Repeat the same table as above with a focus on Criteria and Indicators related to governance.

The principle above the table should be 'Fully enabling governance, policy and institutional environment making forestry attractive for investment, strong clear tenure, strengthened forest user rights, user friendly bureaucracy and procedures etc.'

The criteria in the first column should be 7. Cross cutting legal, policy and institutional framework

Tool 10: Poster with post-it method

Purpose: This method is ideal for a participatory review of a draft set of criteria and indicators, allowing participants to comment on the document directly. Posters with the criteria and indicators can be posted for example in halls in forest dependent communities for feedback.

Procedure

1. After preparing print outs of the national criteria and indicator set with large font on a poster, place them on the wall or board where the meeting is being held and present them.
2. After the presentation, participants can write comments on post-its (stickers) and stick directly on the indicators they want to comment on. Posters can be left up for some time to get comments.
3. After all the comments have been placed on the posters, it is good to ask participants to come and justify the comments.
4. It is important for the facilitation/coordination team to type up the comments within the document for consideration later as to whether the comment merits a modification or not in the Criteria and Indicator set.



Photo: Poster with post-it method.

Tool 11: Multi-stakeholder panel

Purpose: This method is useful to allow stakeholder representatives to give their feedback on a presentation of draft set of Criteria and Indicators, helping verify that an inclusive process was followed and that the final output takes into consideration the interests of key stakeholders.

Procedure:

1. From earlier in the process identify a range of good representatives for each of the key stakeholders that took part in the process.
2. Have representatives from each of the stakeholder groups sit on a table, prior to the presentation of the draft national C&I. Representatives can be rotated for different sections of the presentation.
3. Ask the representatives to assess the relevance of the criteria and indicator from their perspective after each section of the presentation has been made.
4. If there are serious problems with relevance from a stakeholder representative, then recommendations should be made and discussed about how to rectify the problem.



Photo: Multi-stakeholder panel method

Advice: After the document is drafted to take into account any feedback, it should still be circulated further for comment. Also remember that once the document is agreed and finalised, it should in the future be revisited through reviews with stakeholders. Many of the methods within this toolbox are suitable for such reviews.

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