

## C&I: a tool for enhancing SFM, from policy to practice

### Basic knowledge



**This module is addressed to all those interested in sustainability in the forest sector. It defines criteria and indicators (C&I), sets out their main uses, gives examples of existing C&I, and provides links to tools and case studies to help users in understanding and maximizing the potential of this instrument for SFM.**

C&I offer a framework for characterizing the essential components of sustainable forest management (SFM) and for acknowledging the wide range of economic, social and environmental benefits that SFM generates for society.

There are growing expectations that managers demonstrate SFM by quantifying progress towards goals and outcomes. C&I provide a way of consolidating information on the economic, social and environmental aspects of forests, and trends in these, in an understandable and communicable way. Thus, C&I have emerged as a powerful tool for promoting SFM.

**Criteria** define and characterize the essential elements or conditions against which SFM should be assessed, with consideration given to the productive, protective and social roles of forests. Each criterion relates to a key element of sustainability and is elaborated by indicators. Criteria represent the core values or management goals and objectives set forth in national forest programmes and other similar policies and initiatives. A single criterion may be associated with multiple goals and objectives, and vice-versa.

**Indicators** are variables or parameters that enable the measurement of particular aspects of criteria. Indicators help monitor the status of, and trends in, forests in quantitative, qualitative or descriptive terms.

For example, the first criterion of the Montréal Process Working Group on the Conservation and Sustainable Management of Temperate and Boreal Forests, “conserve biological diversity”, expresses a core value held by those countries participating in the Montréal Process. Each of the three subareas of this criterion—ecological diversity, species diversity, and genetic diversity—has three indicators that measure dimensions of the core value. The desired changes will most often be defined in terms of “moving the needle” in a certain direction in one or more of the nine indicators.

**Table 1. Indicators of Criterion 1 of the Montréal Process Working Group’s criteria and indicators for the conservation and sustainable management of temperate and boreal forests**

<b>Criterion 1: Conservation of biological diversity</b>
<b>Ecosystem diversity</b>
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
<b>Species diversity</b>
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
<b>Genetic diversity</b>
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

Source: [The Montréal Process Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests. Fifth edition, 2015.](#)

C&I are also potentially powerful instruments for providing a common understanding of the wide range of economic, social and environmental values of forests. They can help promote agreement on key issues; identify information needs; serve as a reference framework for policy design, planning and programming; facilitate the monitoring of results; and contribute to evidence-based decision-making on forests. Thus, C&I can be employed as a means for verifying the sustainability of forest practices (e.g. through audits) and for achieving consistency in forest management.

ITTO pioneered the development of C&I in tropical forests in the early 1990s, publishing the world's first set of criteria for SFM (*Criteria for the measurement of sustainable tropical forest management*) with the aim of enabling the assessment of the condition of tropical forests in producer member countries and identifying weaknesses in forest practices and the improvements needed. By 2000, based on ITTO's early work and the outcomes of the 1992 Rio Earth Summit, C&I initiatives had been launched worldwide to guide and evaluate the achievement of SFM at different levels, and many countries now produce national reports that assess their progress toward SFM using C&I.

Most C&I processes have customized C&I to meet regional needs. Examples include the C&I of the Lepaterique Process for Central America, the C&I of the Tarapoto Process for Amazonian forests, the Montréal Process, and the African Timber Organization (in collaboration with ITTO). Forest certification processes, such as those of the Forest Stewardship Council and the Programme for the Endorsement of Forest Certification, have used C&I in developing their forest management standards. C&I, therefore, serve useful functions in both policy and market-driven approaches, with direct and indirect links between the two.

The recent adoption of the Sustainable Development Goals (SDGs) is driving "results-based" management and governance in the management of resources, including forests. The forest sector can build on C&I for assessing progress towards various SDGs, especially SDG15.

### **Criteria & Indicators contributes to SDGs:**

**12** RESPONSIBLE  
CONSUMPTION  
AND PRODUCTION



**15** LIFE  
ON LAND



**17** PARTNERSHIPS  
FOR THE GOALS



#### Related modules

- [Forest certification](#)
- [Forest management monitoring](#)
- [Forest management planning](#)
- [Land-use planning](#)

## In more depth

### Criteria for SFM at the global, regional and national levels

Seven common thematic areas (or criteria) of SFM have been identified at the **global** level, based on the criteria of the nine ongoing regional and global C&I initiatives. The seven thematic areas – adopted by the UN General Assembly in 2007 in the Non-Legally Binding Instrument on All Types of Forests – are:

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

The various C&I processes have adapted the criteria to suit specific circumstances (e.g. of ecozones or regions), but all processes have largely similar criteria.

At the **national** or **subnational** level, integrating C&I into forest policies and strategies can strengthen results-based management. This requires that the C&I are tailored to local conditions to ensure they are feasible and practical as well as acceptable to users. Commonly, countries adapt generic global or regional C&I to national or subnational conditions, which may include the development of new indicators pertaining to specific national goals and objectives for SFM. C&I can act as a checklist to ensure that forest policies address all relevant issues. For example, a comparison of a generic set of C&I with a national forest policy might reveal that the latter does not address the issue of invasive alien species; this may stimulate a national-level discussion on the topic. Conversely, the national forest policy may address an issue that is important in the national context but which is absent or underemphasized in the generic C&I, in which case specific indicators may be added to the national (or subnational) C&I.

### Indicators for SFM at the global, regional and national levels

FAO used global-level indicators to structure its global forest resources assessments (FRAs) in 2005, 2010 and 2015, with minor changes in each edition. There is a proposal to use certain indicators for monitoring the contributions of forests to the 2030 Agenda for Sustainable Development (see below). ITTO uses its C&I for reporting by its member countries on tropical forests. Various other bodies – such as the Amazon Cooperation Treaty Organization, the Central African Forest Commission, and Forest Europe – have developed indicator sets for their regional purposes.

Many countries use forest indicators for forest monitoring. The Government of the Russian Federation, for example, approved a national forest programme for 2013–2020 and adopted indicators for monitoring its implementation that are broadly consistent with those of the Montréal Process (Table 2).

**Table 2. Example of Russian national forest programme indicators, compared with those of the Montréal Process**

Montréal Process indicator	Russian National Forest Programme 2013–2020 indicator
Criterion 2: Maintenance of productive capacity of forest ecosystems	
2.a. Area and % of forest land and net area of forest land available for wood production	Proportion of the entire area of forest resources that is leased (target: 26%) Share of the total amount of wood harvesting that consists of cultivation and improvement cuttings (target: 25%)

Source: METLA (2013).

### Types of indicators

Indicators should be SMART (i.e. specific, measurable, achievable, relevant and time-bound). Some might be difficult to quantify in numerical terms, especially in some countries, but the direction of change (e.g. “more of this” or “less of that”) over a given period using qualitative or descriptive indicators might still provide useful insights. In other cases, it might be appropriate to set targets that can be quantified numerically. Measuring a full set of indicators will require a range of approaches (e.g. monitoring, mapping, review/assessments and evaluation/studies), with differing implications for cost and the effort required. A combination of indicator types (i.e. quantitative, qualitative and binary) can be used to measure the status of, and changes in, each criterion (Table 3).

**Table 3. Examples of indicator types**

<b>Indicator type</b>	<b>Economic</b>	<b>Social</b>	<b>Ecological</b>
<b>Quantitative</b> (change is measured numerically)	Share (% contribution) of forest sector to gross domestic product	Number of employees in forest sector Number of occupational accidents in the forest per year	Number of threatened species Area of forest cover in “protected” status (e.g. according to International Union of Conservation of Nature categories)
<b>Qualitative</b> (change is measured in descriptive or semi-quantitative terms)	Structure of forest-based sector Taxation and other economic strategies that affect SFM	Public perception of forest management Level of importance of forests to the general population	Political framework and instruments for climate change adaptation Geospatial mapping of land-use and land-use change
<b>Binary</b> (yes/no response – a type of qualitative indicator)	Mandatory system of management plans in place for forest enterprises (y/n)	Existence of work safety regulations (y/n)	Existence of a national forest programme (y/n)

***Main uses of C&I***

C&I constitute a common policy tool to assist countries in monitoring, assessing and reporting on trends in forest conditions and progress toward SFM at various levels. By providing a common framework within and between countries while allowing for differences, C&I have the potential to help decision-makers in policy and practice to:

- strengthen the development of results-based forest-related policies, programmes and plans and monitor their implementation;
- promote and provide incentives for the transition to sustainable forest practices and forest management certification;
- strengthen dialogue with other sectors and demonstrate the contributions of forests to sustainable development and the well-being of society; and
- monitor, assess and report on progress towards SFM and thereby to sustainable natural resource management and land use.

***Using C&I for SFM in a results-based approach***

**In recent decades there has been growing interest in results-based approaches among multilateral institutions, governments and other international actors. At the Rio+20 Summit in June 2012, member states agreed to create a set of universal and integrated SDGs, and the UN General Assembly adopted these in 2015. It is expected that the SDGs will stimulate action in support of the three dimensions of sustainable development – economic, social and environmental – to 2030. Tracking and analysing the outcomes of efforts to achieve the SDGs is crucial for maximizing efficiency and effectiveness.**

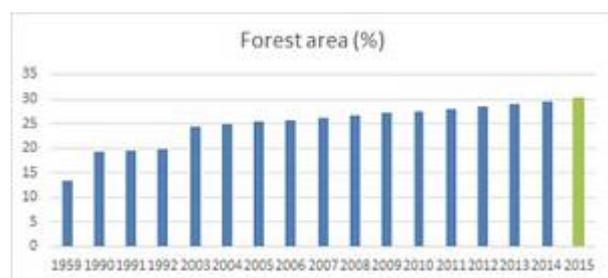
**Results-based management (RBM) is characterized by a focus on results rather than inputs and activities. In practical terms, RBM requires that design, planning and implementation are geared to clearly describing the impacts and outcomes sought – that is, the results – and tracking progress towards these, rather than simply ensuring that all activities are implemented as planned. This is not to say that the activities are unimportant; rather, it means that the focus is on the impact of those activities in improving the situation in a given country and in bringing about positive changes in people’s lives.**

**There is growing recognition of the important role that C&I play in strengthening RBM in forestry by promoting SFM while taking into consideration the economic, social and environmental needs of stakeholders. C&I are useful in many contexts and at different levels; they can be important in shaping national forest policy processes and providing a means for**

defining goals, measuring progress, and conveying key messages on SFM.

At the Earth Summit in 1992, for example, the Government of Cuba committed to increasing the country’s forest area to 29.3 percent of the land area by 2015, up from 13.4 percent in 1959. The indicator “forest area” was retained and used consistently over many years, allowing the assessment of changes related to the political goal (i.e. the result) over time. Figure 1 shows the change in the indicator “forest area” from 1959 to 2015.

Figure 1. Forest area in Cuba, 1959–2015



Source: Herrero Echevarría (2015); World Bank (2016).

In Viet Nam, the area and quality of forests have declined over the years due to unsustainable management and conversion to other land uses for socio-economic development. Indicators are being used under the country’s Forestry Development Strategy (2006–2020) to measure the status of the forest sector and define targets, with the objective of reversing forest decline (Table 4).

Table 4. Viet Nam Forestry Development Strategy, 2006–2020

Data description	Year	Forest area (million ha)	Forest area as percentage of total land area
Situation (as described in the Forestry Development Strategy 2006–2020)	1943	14.3	43
	1990	9.18	27.2
	2005	12.61	37
Desired result (objective of the Forestry Development Strategy 2006–2020)	2010	<i>Not specified</i>	42–43
	2020	16.24	47

Source: Socialist Republic of Viet Nam (2007).

In Africa, human–wildlife conflicts can lead to losses of crops and livestock, with impacts on food security and human safety and well-being. A monitoring system called KoBoCollect uses smartphones to collect data on wildlife species and their conflicts with humans. The system is being tested in Cameroon, the Central African Republic, Gabon, Chad, the Congo, the Democratic Republic of the Congo and Equatorial Guinea as a way of generating information that can be used in the design and implementation of measures to limit conflict and to assess

the impacts of such measures as part of RBM.

C&I can be applied in the three main stages of RBM in a programme cycle: 1) strategic planning (i.e. policy/programme design); 2) operational planning; and (3) monitoring, evaluation and learning (Figure 2).

Figure 2. The uses of C&I, by stage of the RBM life cycle



#### Using C&I to support sustainable practices and forest certification

C&I are potentially powerful tools for supporting sustainable practices. C&I were developed for temperate and tropical forests in southeastern Mexico based on a review of 14 national and international C&I initiatives (including, at the international level, the C&I of the Lepaterique process, the Amazon Cooperation Treaty Organization, the African Timber Organization, ITTO, the Montréal Process and the Forest Stewardship Council). C&I were generated to suit the Mexican social, cultural and legislative context through a participatory process that involved, among other things, knowledge exchange and the reconciliation of potentially conflicting interests and which made it possible to accommodate the day-to-day realities of communities, including local cultural aspects. Verifiers were created for each indicator and a reference value or standard was defined for each verifier. Each reference value has three performance levels – 1) limited; 2) medium; and 3) good – enabling realistic, accurate evaluations of forest management sustainability.

In Namibia, communities and institutions promoting community-based forest management are using C&I to monitor forest management. There is no national set of C&I in Namibia, but practitioners have borrowed from other C&I processes, particularly ITTO and the Dry-zone Africa process. The main motivation for using C&I in Namibia is to assist in the development of forest management plans and to monitor the impacts of negative influences on forest extent and condition. Local communities depend heavily on forest resources for their living: management plans, based on C&I, are a compulsory prerequisite for the Namibian forest administration to transfer use rights for forest products to local communities. The condition of forest stands, and compliance with agreed community-specific forest management systems and regulations, are monitored based on C&I. If discrepancies are detected, standard operational procedures are applied as an incentive to guide community members and forest administration staff to reorganize the management system according to agreed rules and regulations. Community members and their traditional leaders were strongly involved in the development of these regulations, and this involvement has increased community acceptance of, and compliance with, them. Forest administrations tend to develop comprehensive C&I sets that cover all possible aspects of SFM; on the other hand, C&I must be simple enough that the monitoring does not exceed the capacity of communities and the forest administration itself, either financially or technically (see Table 5 for examples of the C&I used for Namibian community forests).

Table 5. Examples of C&I used in Namibian community forests

Criteria	Indicators
Tree species composition	<ul style="list-style-type: none"> <li>• Number of trees by species</li> <li>• Basal area by species</li> <li>• Tree volume by species</li> </ul>
Sufficient good-quality regrowth	<ul style="list-style-type: none"> <li>• Diameter and quality distribution function</li> </ul>
Forest fire	<ul style="list-style-type: none"> <li>• Area of prescribed early burnings</li> <li>• Number of fires, August–November</li> <li>• Burned area, August–November</li> <li>• Number of “hot” fires in consecutive years</li> </ul>

Forest certification has been promoted since the early 1990s as a mean to tackle global deforestation and forest degradation and as a way of bringing about responsible, transparent forest management. The Forest Stewardship Council (FSC) was established in 1993 by WWF and other environmental NGOs, timber traders, indigenous peoples' groups, forest worker organizations, and other stakeholders to promote SFM globally. A study undertaken in three Congo Basin countries (Cameroon, Gabon and the Congo) indicates that FSC certification has pushed companies to make remarkable social progress in the region. Table 6 provides examples of indicators used in FSC Principle 4, “Community relations and workers’ rights”, in Namibia.

**Table 6. Criteria and associated indicators for Namibian community forests, under FSC principle 4** (“Community relations and workers’ rights: forest management operations shall maintain or enhance the long-term social and economic well-being of forest workers and local communities”)

Criterion	Indicators
4.1. The communities within, or adjacent to, the forest management area should be given opportunities for employment, training, and other services	4.1.1. When members of populations within or adjacent to the FMU possess similar skills to foreigners, employees shall be preferably recruited from among these populations
	4.1.4. The forest manager shall contribute to the basic education of employees’ children, as per the contractual requirements/provisions established on the basis of national standards
	4.1.6. The forest manager shall contribute to the improvement of the health condition of neighbouring populations as established in national regulations
4.2. Forest management should meet or exceed all applicable laws and/or regulations covering health and safety of employees and their families	4.2.1. The forest manager shall undertake to take preventive measures to minimize accidents at work related to forest operations. Working conditions shall comply with the labour code and International Labour Organization recommendations. Rules and procedures shall exist and shall be distributed to employees to make them aware of the need to comply with safety regulations. Appropriate safety gear shall be distributed to workers and the latter shall use them when they are in their respective working places. Workers shall pass medical examinations as established in national legislation
	4.2.2. The condition of employees’ and their families’ health shall be compliant with the applicable regulations of the legislation in force. The forest manager shall undertake to take measures to ensure adequate public health and safety conditions (potable water, lavatories, buckets, etc.). Health centres shall be provided and shall operate with qualified medical personnel on site. Health centres shall be sufficiently well supplied with medicines as per applicable legislation. The forest manager shall take practical steps to supply his or her workers with good quality products and food commodities as per the local market price listing

Forest management can give rise to conflicts between cultures and stakeholder groups, and C&I are means to facilitate the conflict resolution process. In the Brazilian Amazon, for example, the application of the FSC C&I brings transparency to unresolved conflicts over tenure and use and facilitates discussions among stakeholders. As set out in the FSC C&I, certification requires clarity on land tenure and use rights by traditional peoples and the absence of conflicts that could threaten the safety of individuals and the integrity of forest resources. When the timber company Mil Madeireira Itacoatiara Ltda (Precious Woods Amazon) embarked on a certification process in its Amazonian forest covering 82 000 hectares, it was aware that families were living in the company’s forest but had no relationship with them. During the certification assessment it became clear that, although there was no apparent conflict, the potential for conflict existed. The families living in the area were using fire to clear agricultural plots, an action that could threaten forest management; on the other hand, the families did not recognize Mil Madeireira as the legitimate owner of the area. One of the conditions of certification was that no forest management activity was permitted in forest compartments adjacent to the occupied areas. The company was also required to survey all the families in its forest area and submit a proposal for formally recognizing their land tenure rights. To formalize the legal position of the families with regard to their rights, and after two years of work with the state government, the company decided to demarcate the occupied areas, jointly with the communities, including some forest areas. As a final step, the company gave each family a letter officially recognizing that family’s tenure rights. Thus, thanks to FSC certification requirements, as set out in the C&I, 142 families received land titles within the framework agreement signed between the Government of Amazonas and the certified company Mil Madeireira.

Chile lacks major reserves of fossil fuels (oil and gas), but it has huge potential for forest production (45 percent of the country is classified as suitable for forestry). Chile faced problems in the production and marketing of woodfuel, particularly illegal logging. In response, the

country developed a voluntary national certification system for woodfuel with the aim of regulating the market. The certification system has four requirements: 1) that traders are formally registered (thereby satisfying legal requirements); 2) the source of the fuelwood is identified (for which there is a forest management plan); 3) a quality product is delivered (the woodfuel has a moisture content of less than 25 percent); and 4) relevant, accurate and truthful information about the product is delivered to consumers. The main subjects of the certification system are woodfuel merchants; those interested in certification must appear in person at the local technical office to receive the necessary information and guidance. The orderly and standardized supply of certified woodfuel has steadily increased since 2007, when the scheme came into effect, helping develop a sustainable market and encouraging a public discourse on woodfuel use.

### **Using C&I to demonstrate the contribution of forests to sustainable development**

The SDGs agreed by the UN General Assembly in September 2015 comprise 17 goals, 169 targets and 231 indicators, collectively aimed at guiding and measuring progress towards sustainable development to 2030. Forests are relevant to most of the SDGs because they provide a wide range of economic, social and environmental benefits that contribute to sustainable livelihoods, income and employment generation, food production, more resilient and sustainable production and consumption systems, and the mitigation of, and adaptation to, climate change.

Quantifying such contributions is not always possible at the global level due to data gaps and challenges in the collection of globally comparable socio-economic information on forests. Nevertheless, the SDGs acknowledge the broad role of forests in 12 forest-related targets, including those associated with SDG15 (“protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss”), which explicitly places SFM in the 2030 Agenda for Sustainable Development. Forests are also addressed explicitly in target 6.6 of SDG6 on water, and they are crucial for achieving many of the other SDGs and associated targets. Forests are linked to poverty eradication (SDG1); food security and nutrition (SDG2); health (SDG3); gender equality (SDG5); sustainable energy (SDG7); sustainable economic growth (SDG8); infrastructure and innovation (SDG9); sustainable consumption and production (SDG12); climate change (SDG13); peaceful and inclusive societies, justice, and accountable institutions (SDG16); and means of implementation (SDG17).

Data on forests will contribute directly to monitoring progress towards the 12 SDG targets through 13 forest-related indicators. The collection of socio-economic data on forests can improve the overall quality of socio-economic indicators for the SDGs, such as in-kind income and the increased use of forest products in value chains. Work on C&I will be instrumental in the production of national and regional-scale socio-economic information on forests as well as for other monitoring processes, such as FAO’s FRAs, leading to the improvement of forest-related socio-economic data at the global level.

To monitor progress towards the SDGs and associated targets, the United Nations Statistical Commission has established the Inter-Agency and Expert Group on Sustainable Development Goal Indicators. FAO and other relevant agencies are developing a general approach for identifying forest indicators to be used in the SDG framework, and FAO is developing a limited set of forest-related contributions to SDG15 (Table 7).

**Table 7. Targets and indicators for SDG15**

<b>SDG15: “Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss”</b>	
Target 15.1 By 2020, ensure the conservation, restoration, and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains, and drylands, in line with obligations under international agreements	Indicator 15.1.1 Forest area as a proportion of total land area
Target 15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests, and substantially increase afforestation and reforestation globally	Indicator 15.2.1 Progress towards sustainable forest management
Target 15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world	Indicator 15.3.1 Proportion of land that is degraded over total land area
Target 15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development	Indicator 15.4.1 Coverage of protected areas of important sites for mountain diversity Indicator 15.4.2 Mountain Green Cover Index

Data collection, monitoring and reporting for indicator 15.2.1 (“Progress towards sustainable forest management”) is complex because no

single variable can fully reflect progress towards SFM. The indicator will be monitored through four subindicators related to changes in forest area and carbon stocks, the area designated for biodiversity conservation, and the area under SFM certified by independent forest management certification schemes.

**Using C&I to monitor, assess, report and measure progress towards SFM**

Monitoring changes in forests and forest management requires the availability of consistent, comparable and valid data over time. For each indicator, therefore, several elements need to be identified: the data sources (i.e. the means of verification); the methods of data collection and estimation; the tools for data collection; appropriate models (where required); the statistical sampling framework (for generating representative results and for evaluation); the timing and frequency of data collection; the training required for data collection, entry and analysis; and the responsibilities of various actors for each indicator. These details should be documented in a monitoring and evaluation plan, which ideally will also specify the baseline and target for each indicator. Table 8 presents a simple monitoring and evaluation plan for Nigeria.

**Table 8. Nigeria’s National Biodiversity Strategy and Action Plan (NBSAP) monitoring and evaluation plan**

Indicator	Responsibility	Data for indicator		Data-gathering method	Means of verification	Collection and reporting frequency
		Base-line	Target			
(of impact) % of the population aware of the importance of biodiversity	Federal Department of Forestry (FDF)	N/A	30% in 2020	Surveys of representation groups of the population to be carried out OR Estimate of number of people reached by outreach activities	Survey results  Results of estimate	Start and end of programme
(of performance) No. of outreach and awareness campaigns	National Orientation Agency (NOA)	N/A	20 in 2020	Review of outreach campaign reports	Annual report	Annual
(of performance) No. of public discussions	NOA	To be imputed by FDF	10 in 2020	Review of public discussions Reports	Newsletter NOA reports to NBSAP	Annual
(of performance) No. of states in Nigeria with outreach activities	NOA	N/A	At least 50% in 2020	Review of outreach activities and reports at annual NBSAP meeting	Newsletter	Annual

At the global level, FAO has been monitoring the world’s forests at 5–10-year intervals since 1946. FRAs are now produced every five years in an attempt to provide a consistent approach to describing the world’s forests and how they are changing. The scope of the FRA has changed over time and is now driven largely by developments in C&I processes because its questionnaire — which is sent to countries as a primary source of data – is now based largely on indicators derived from one or more C&I process.

ITTO published its first “status of tropical forest management” report in 2006 and the second edition in 2011. These reports compile data provided by ITTO tropical member countries based on the ITTO C&I, as well as other available sources of information, to generate comprehensive estimates of the extent of tropical forest under sustainable management.

**Increasing the use of C&I**

The extent to which C&I are applied varies by region, subregion and country, and there remains confusion about how best to formulate and use them. C&I are still often perceived as a complex tool with little added value. Consequently, there is a low level of interest among the

main actors that should be using them – such as forest administrations, communities and economic operators. Many national governments are reluctant to provide adequate funding for the development and deployment of C&I, and efforts to develop nationally appropriate C&I must therefore often rely on support from international bodies.

A number of significant challenges need to be addressed if C&I are to be used to best effect. The following seven measures, if taken together, will put countries on a solid path towards improving national forest planning and, more importantly, achieving SFM and thereby the sustainable supply of forest goods and services for the benefit of society:

1. Demonstrate and communicate the added value of C&I (e.g. to increase transparency and the participation of stakeholders, and to fight corruption).
2. Promote leadership and ownership through inclusive participation in national forest programmes and the development of C&I.
3. Provide adequate funding for the implementation of national forest programmes and their monitoring and evaluation.
4. Simplify and harmonize the various sets of C&I.
5. Ensure effective and innovative data management.
6. Facilitate a cross-sectoral, landscape approach.
7. Reinforce capacity building and feedback.

## Further learning

**Arnold, F.E., van der Werf, N. & Rametsteiner, E.** 2014. [Strengthening evidence-based forest policy-making: linking forest monitoring with national forest programmes](#). Forestry Policy and Institutions Working Paper No. 33. Rome, FAO.

**FAO.** 2016. [Criteria and indicators for sustainable forest management](#).

**FAO.** 2016. [Forest-related indicators, monitoring and reporting progress related to the achievement of the Sustainable Development Goals](#). Document COFO/2016/5.2. Twenty-third Session of the Committee on Forestry. Rome.

**FAO.** [Voluntary guidelines on national forest monitoring](#). Draft version for discussion of sections I and II.

**FAO.** 2012. [FRA 2015 terms and definitions](#). Forest Resources Assessment Working Paper 180. Rome.

**FAO.** 2010. [Global Forest Resources Assessment 2010](#). Rome.

**Grainger, A.** 2012. Forest sustainability indicator systems as procedural policy tools in global environmental governance. *Global Environmental Change*, 22 (1): 147–160.

**Han, X., Smyth, R.L., Young, B.E., Brooks, T.M.M., Sánchez de Lozada, A., Bubb, P., Butchart, S.H.M., Larsen, F.W., Hamilton, H., Hansen, M.C. & Turner W.R.** 2014. [A biodiversity indicators dashboard: addressing challenges to monitoring progress towards the Aichi biodiversity targets using disaggregated global data](#). *PLoS ONE*, 9(11): e112046. doi:10.1371/journal.pone.0112046

**Herrero Echevarría, J. A.** 2015. El uso de los criterios e indicadores como marco y guía para la implementación y promoción del diálogo sobre políticas, planes y programas forestales en Cuba. Estudio de caso. Proyecto "Fortalecimiento de los criterios e indicadores para la gestión forestal sostenible y su uso en la política y la practica forestales". FAO.

**Howell, C., Wilson, A. & Butcher, G.** 2015. Achievements in Australia from using a criteria and indicator framework for forest reporting. Paper presented at the XIV World Forestry Congress, Durban, South Africa, 7–11 September 2015.

**Julve Larrubia, C., Ross, K., Wolfslehner, B., Guldin, R. & Rametsteiner, E.** 2016. *Using criteria and indicators (C&I) for sustainable forest management (SFM): a way to strengthen results-based governance of national forest programmes (NFPs)*. FAO Working Paper. Rome, FAO.

**Malleux, J.** 2015. Monitoreo para la conservación del bosque nativo en Argentina. Estudio de caso V. Proyecto "Fortalecimiento de los criterios e indicadores para la gestión forestal sostenible y su uso en la política y la practica forestales". FAO.

## Web references

[Implementing criteria and indicators for sustainable forest management in Europe](#) (last accessed 13.02.2017)

[International Tropical Timber Organization](#) (last accessed 13.02.2017)

[Sustainable Development Goals](#) (last accessed 13.02.2017)

[Sustainable Development Goals indicators](#) (last accessed 13.02.2017)

[Sustainable Development Knowledge Platform – Sustainable Development Goals](#) (last accessed 13.02.2017)

The Montréal Process Working Group. 2015. [Criteria and indicators for the sustainable management of temperate and boreal forests](#). 5th edition. (last accessed 13.02.2017)

[Montréal Process](#) (last accessed 13.02.2017)

US Forest Service. [Forest sustainability and planning: types of sustainability criteria and indicator efforts](#) (last accessed 13.02.2017)

## Credits

This module was developed with the kind collaboration of the following people and/or institutions:

**Initiator(s):** Cecilia Julve - FAO Consultant

**Contributor(s):** Kimberly Ross Kane - International development consultant; Bernhard Wolfslehner - European Forest Institute (EFI); Ewald Rametsteiner - FAO Forestry Department; Steve Johnson - ITTO; Michael Kleine - IUFRO.

