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Uses and impacts of criteria and indicators for sustainable forest management

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INTERNATIONAL TROPICAL TIMBER ORGANIZATION

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Indicating progress: uses and impacts of criteria and indicators for sustainable forest management

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The International Tropical Timber Organization (ITTO) is an intergovernmental organization promoting the conservation and sustainable management, use and trade of tropical forest resources. Its members represent the bulk of the world's tropical forests and of the global tropical timber trade. ITTO develops internationally agreed policy documents to promote sustainable forest management and forest conservation and assists tropical member countries to adapt such policies to local circumstances and to implement them in the field through projects. In addition, ITTO collects, analyzes and disseminates data on the production and trade of tropical timber and funds projects and other actions aimed at developing industries at both community and industrial scales. Since it became operational in 1987, ITTO has funded over 1000 projects valued at over US$350 million. All projects are funded by voluntary contributions, with major donors to date the governments of Japan, Switzerland, the United States of America, Norway and the European Union.

Front cover photo: Foresters undergoing training in applying the ITTO C&I at field level in Pahou Forest, Benin. Photo: Direction de Gestion des Forêts et des Ressources Naturelles (DGFRN)

Back cover photo: Aerial photo of forest in northern Republic of Congo managed using the ITTO C&I. Photo: Centre National d'Inventaires et d'Aménagement des Ressources Forestières et Fauniques (CNIAF)

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FOREWORD

ITTO pioneered the development of criteria and indicators (C&I) for sustainable forest management in the early 1990s to assess the conditions of natural tropical forests in producer member countries and to help identify 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, a number of other C&I initiatives had been launched worldwide.

In the intervening years, ITTO has continued to provide leadership in implementing C&I. In total, the Organization has invested around US$30 million in training workshops and projects to build the capacity of tropical timber producer countries to use and apply C&I, with the overall aim of improving the management of tropical forests. It is easily the biggest investment in C&I for sustainable forest management made by any international organization.

After more than 20 years of investment and experiences, the International Tropical Timber Council believed it was time for a comprehensive assessment of the ways in which C&I have been applied and the extent to which they have contributed to improved forest policies and management practices. In 2011, therefore, ITTO commissioned a wide-ranging study of the role of C&I. Specifically, the study was intended to provide information on the experiences of countries worldwide in using C&I, identify trends and developments, and look at ways to increase the impact of ITTO's C&I in the field. The study included an examination of five major C&I processes involving about 90 countries with tropical, temperate or boreal forests.

This publication, which reports the results of the study, examines the early evolution of C&I for SFM, developments in the five C&I processes and in international forest policy since 2000, the responses of governments, non-governmental organizations and the private sector to surveys on C&I, and trends and emerging issues related to C&I. It draws firm conclusions and proposes a number of recommendations for ITTO and others to consider.

This publication is particularly timely in light of ongoing talks about the role of forests in climate-change mitigation and recent collaboration among C&I processes and FAO to streamline and rationalize national reporting on forests. I have no doubt it will make an important contribution to both global forest policy discussions and ITTO's ongoing work. I congratulate the authors of the report – Stephanie Caswell, Ivan Tomaselli and Sofia Hirakuri – for their excellent work, my colleagues in the ITTO secretariat who supervised the study, and all those who participated in the surveys and interviews that provided much of the content of this publication.

Emmanuel Ze Meka
ITTO Executive Director
April 2014

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ACRONYMS AND ABBREVIATIONS

ACTO	Amazon Cooperation Treaty Organization
AF&PA	American Forest and Paper Association
AFS	Australian Forestry Standard
AIMEX	Association of Timber Industries Exporters (Pará, Brazil)
ATO	African Timber Organization
C&I	criteria and indicators
CBD	Convention on Biological Diversity
CERFLOR	Brazilian Program of Forest Certification
CFB	*Camara Forestal de Bolivia* (Forestry Chamber of Bolivia)
CIFOR	Center for International Forestry Research
CoC	chain of custody
CONAFOR	Mexican National Forest Commission
COP	conference of the parties
CPF	Collaborative Partnership on Forests
CSA	Canadian Standards Association
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FMP	forest management plan
FMU	forest management unit
FLEGT	forest law enforcement, governance and trade
Forest instrument	Non-legally Binding Instrument on All Types of Forests
FPCD	Foundation for People and Community Development
FRA	global forest resources assessment
FSC	Forest Stewardship Council
GAFC	Global Alliance of Community Forestry
GEF	Global Environment Facility
GIS	geographic information system(s)
ICF	Indigenous Community Forestry Group Certification Scheme (PNG)
IEA	International Energy Agency
IFF	Intergovernmental Forum on Forests
IFFA	International Family Forest Alliance
IPF	Intergovernmental Panel on Forests
ISCI	Intergovernmental Seminar on Criteria and Indicators
ISO	International Organization for Standardization
ITTC	International Tropical Timber Council

ITTO	International Tropical Timber Organization
IUCN	International Union for Conservation of Nature
IUFRO	International Union of Forest Research Organizations
MAR	monitoring, assessment and reporting
MC&I	Malaysian criteria and indicators
MCPFE	Ministerial Conference on the Protection of Forests in Europe (FOREST EUROPE)
NGO	non-governmental organization
OECD	Organisation for Economic Co-operation and Development
OLB	*origine et legalite des bois* (Cameroon system for the verification of timber origin and legality)
PAFC Gabon	Gabonese Forest Certification Scheme
P&C	principles and criteria
PC&I	principles, criteria and indicators
PEFC	Programme for the Endorsement of Forest Certification
PROFOR	Program on Forests
PEOLG	Pan-European Operational Level Guidelines for Sustainable Forest Management
REDD	reducing emissions from deforestation and forest degradation in developing countries
REDD+	reducing emissions from deforestation and forest degradation, and the role of conservation of forest carbon stocks, sustainable forest management and the enhancement of forest carbon stocks
RIL	reduced impact logging
SFI	Sustainable Forestry Initiative
SFM	sustainable forest management
SFM Tropics	Status of Tropical Forest Management (periodic ITTO report, published to date in 2005 and 2011)
SODEFOR	*Societé de Developpement des Forêts* (Cameroon)
STA	Sarawak Timber Association
TFF	Tropical Forest Foundation
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests
VPA	voluntary partnership agreement

EXECUTIVE SUMMARY

Criteria and indicators (C&I) for sustainable forest management (SFM) are one of the most important and innovative policy instruments for operationalizing the emerging concept of SFM. ITTO pioneered their development in the early 1990s to assess the conditions of natural tropical forests in producer member countries and to help identify weaknesses in forest practices and the improvements needed. Based on this early work and the outcomes of the 1992 Rio Earth Summit, C&I initiatives were launched around the world.

By 2000, nine regional and international C&I processes involving some 150 countries had been introduced, a number with support from ITTO, the Food and Agriculture Organization of the United Nations (FAO) and the United Nations Environment Programme (UNEP). These processes were subsequently endorsed by the international forest policy community as tools for monitoring, assessing and reporting on trends in forest conditions and progress toward SFM and, in turn, for informing policy and management decisions. While the resulting sets of C&I differed in various respects, they all reflected a holistic approach to forests as ecosystems with multiple values beyond the production of wood and fiber. Criteria represented the essential economic, social, environmental and policy elements of SFM; indicators provided the ways to measure them.

In the last decade, ITTO has continued to provide leadership in the review, improvement and implementation of C&I, and this has been among the Organization's most important policy development endeavors. ITTO has invested about US$30 million in training workshops and projects to build the capacity of its tropical timber producer member countries to apply C&I at the national and forest management unit (FMU) levels, with a view to improving tropical forest management. Several other C&I processes, including in the temperate and boreal forest regions, have also been active, improving initial sets of C&I based on the experiences of countries in data collection, analysis and reporting.

Today, it is recognized that C&I have contributed to a common understanding, within and among countries, of what is meant by SFM. They have also provided a common approach to assessing forest trends and progress towards SFM and a platform for exchanging knowledge, experiences and lessons learned. The ITTO C&I are used by countries to report on their progress towards SFM and in ITTO's reports on the status of tropical forest management (known as SFM Tropics). C&I have led to the identification of the "seven thematic elements of SFM", which are drawn from the criteria common to process-level sets of C&I and now form the basis and organizing framework for the periodic global forest resource assessments (FRAs) coordinated by FAO.

At the same time, however, little information has been compiled on the ways in which C&I have been operationalized and how they have contributed to improved forest policies and management practices. This study was undertaken to gain a better understanding of the experiences of countries worldwide in using C&I and the impacts of those uses on SFM, as well as to identify relevant trends, developments and emerging issues. Proposals are made to strengthen the impact of ITTO's C&I in the field, inform a possible review of ITTO's current C&I, and increase collaboration among C&I processes.

Scope of the study

The study was global in nature and focused on the following five active C&I processes, which together involve about 90 countries with tropical, temperate or boreal forests:

- ITTO C&I for the sustainable management of natural tropical forests;
- African Timber Organization (ATO)/ITTO principles, criteria and indicators (PC&I) for the sustainable management of African natural tropical forests;
- Tarapoto Process on C&I for the sustainability of Amazonian forests (coordinated by the Amazon Cooperation Treaty Organization, ACTO);
- Pan-European C&I for SFM (coordinated by FOREST EUROPE); and

- Montreal Process Working Group on C&I for the conservation and sustainable management of temperate and boreal forests.[1]

The sets of C&I currently used by the five processes are conceptually similar, but differ, sometimes significantly, in scale, emphasis and level of detail. ITTO's C&I, revised most recently in 2005, closely integrate national-level and FMU-level C&I. Seven criteria and 48 indicators apply at both levels; an additional nine indicators apply at the national level only. The ATO/ITTO PC&I were developed in 2001 and reflect a highly successful early collaboration between ITTO and African tropical timber producers. The detailed PC&I are normative in nature[2] and comprise four principles (one national, three FMU), under which are a total of 20 national and FMU-level criteria, 90 indicators and 145 sub-indicators. The Tarapoto Process dates from the same period and focuses on a core set of seven criteria (three national, three FMU, one international) and 15 indicators as priorities for field validation in the Amazon region; these priority C&I are drawn from more detailed C&I contained in the 1995 Tarapoto Proposal.

The pan-European C&I were last reviewed in 2002 and include six regional/national criteria with 52 quantitative and qualitative indicators. The Montreal Process includes seven national-level criteria and 54 indicators, which were updated in 2007–2008 following a comprehensive review. It is significant that neither process has elaborated FMU-level C&I (or plans to do so) due to the significant differences among participating countries (noted below). The lack of FMU C&I does not mean that temperate/boreal countries have not operationalized C&I in ways that have had a positive effect on forest management, but that such applications may be indirect.

In addition to variations among C&I processes, countries within and across processes differ significantly in their forest governance structures (e.g. centralized versus decentralized), forest ownership patterns (e.g. one government owner versus millions of small private owners), existing forest policy frameworks and forestry traditions, and forest types, extents and distributions. These factors, together with capacity issues, affect how countries use and apply C&I.

1 Many ATO/ITTO and Tarapoto countries are ITTO producers. Many pan-European and Montreal Process countries are ITTO consumers.
2 C&I used by the other four processes are formulated as neutral rather than performance measures.

Methodology

The differences among sets of C&I, particularly regarding FMU-level C&I, mean there is no common framework across processes for assessing the field-level use of C&I or their impacts on forest practices. This lack of a common C&I structure meant that the study had to take a broad approach to accommodate the different ways in which countries may have operationalized C&I through national or subnational forest policies, programs and regulations that affect how forests are managed at the field level.

Based on consultations with the ITTO secretariat, it was decided that the most effective and efficient way to obtain factual information from a wide range of countries and C&I users at various levels was through the use of questionnaires. Two surveys were developed to target:

- government officials with responsibilities at the national and subnational (e.g. state, provincial, regional and local) levels for forest policy, planning, regulation and/or management[3]; and
- private forest stakeholders, including companies, associations and other operators subject to government policies and regulations, as well as forest certification programs.

Between March and December 2011, the Executive Director circulated the government survey to about 100 officials in 40 countries, including 32 ITTO member countries for which contact information was provided by ITTO focal points. At the same time, the second survey was circulated to private and other non-government stakeholders in 70 countries, including virtually all ITTO members, based on contact information drawn from ITTO and consultant databases, internet searches and personal contacts.

While survey responses provide the foundation for the study, the consultants also drew on ex-post evaluations of ITTO-funded C&I projects in Asia, recent regional and international forest assessments, a set of 25 "success stories" associated with ITTO projects and activities, and the outputs of recent C&I process collaborative meetings.

3 A pilot survey with limited circulation helped determine the suitability of questions for countries participating in processes without FMU-level C&I.

Overview of government survey results

Survey responses were received from 46 forest officials in 25 countries, including 17 responses from ten ITTO producer countries[4], mostly from Latin America, and 25 responses from eleven ITTO consumer countries associated with the pan-European or Montreal C&I processes.[5] ITTO ex-post evaluations and success stories were used to bring forward the experiences of African and Asian producers not represented in survey responses.[6] Four responses were also received from non-ITTO members.[7]

Together, responding forest authorities own, manage and/or regulate about 1 billion hectares (ha) of public and private forests, of which 40% is in the tropics. This represents 25% of the world's forests and an estimated 45–50% of production forests, which is significant. Responses provide a good overall picture of the range of C&I applications and impacts, which vary widely by country due to factors noted above.

C&I as a framework for forest monitoring, assessment and reporting

Within the ITTO, ATO/ITTO and Tarapoto processes[8]:

- C&I are generally, but not consistently, used as a framework for monitoring, assessment and reporting (MAR) at the national level and for reporting to ACTO, FAO and ITTO.
- Several countries have developed their own sets of C&I based on ITTO's C&I to reflect national and FMU circumstances and special forest ecosystems (e.g. mangroves).
- A number of countries, often with ITTO assistance, have used C&I frameworks to strengthen national and FMU baseline data and forest inventories and to build databases on social and environmental indicators.
- The application of FMU C&I is uneven across countries. Some countries are using FMU C&I to:
  - monitor and evaluate FMU management based on forest management plans (FMPs) or other operational plans;
  - evaluate and report on progress towards SFM at broader levels by aggregating FMU-level data; and
  - report on certified forest areas.
- ITTO FMU C&I are typically used for monitoring and reporting on ITTO-financed projects.

Within the Pan-European and Montreal processes:

- C&I are widely used as the framework for periodic MAR at the national level and for national reporting at the regional/process and international levels, including for FRAs.
- Process-level C&I have often been stepped down or otherwise adapted to national circumstances (e.g. by developing national-level C&I) to facilitate MAR.
- National-level reporting may be more detailed and comprehensive than C&I and may draw on additional sources of information.
- In federations, national-level data for many indicators is typically obtained by aggregating field data provided by states/provinces.
- Process/national-level C&I may provide a basis for MAR at the subnational and FMU levels.
- A number of state/provincial forest authorities have identified subsets of C&I (e.g. core indicators) for use as a MAR framework, including in some cases at the FMU level.
- In some countries, trends observed through C&I-based MAR have highlighted problems and catalyzed needed adjustments in forest policies and practices.
- C&I have widely been used to organize, compile, present and communicate existing forest-related data and information.

Applications of C&I in forest policies, programs, plans and regulations

A number of countries across the five C&I processes have operationalized C&I by incorporating them in various ways and at various levels into forest policies, plans or regulations, sometimes in response to information generated by C&I-based

4 Brazil, Colombia, Côte d'Ivoire, Guatemala, Guyana, Honduras, Malaysia, Mexico, Peru and Togo.
5 Australia, Canada, China, Finland, Japan, Korea, New Zealand, Norway, Sweden, the United Kingdom and the United States.
6 Ghana, Gabon, Indonesia, the Philippines and Thailand.
7 Argentina, Chile, the Russian Federation and Slovenia.
8 While Mexico is also a member of the Montreal Process, its responses are incorporated in those of ITTO producers.

MAR. For example, individual ITTO producers, often facilitated by ITTO training and projects, have applied national and FMU C&I as a basis or framework for one or more of the following:

- forest-related legislation and regulations at the national, local or FMU levels;
- forest-related planning at the state/provincial, river basin or FMU levels;
- developing and approving FMPs and monitoring/evaluating compliance;
- establishing best management practices and other technical standards;
- preparing forest management guidelines, procedures and manuals;
- formulating terms of concession contracts, licences and logging permits, evaluating performance and auditing;
- developing legality and chain-of-custody (CoC) control and verification systems;
- carrying out environmental monitoring and impact assessments; and
- developing national forest certification schemes.

In a number of European and Montreal Process countries, C&I have been integrated into, or helped shape, national forest programs (NFPs), strategies, plans or guidelines. Individual countries have also applied C&I in the context of:

- improving forest legislation and regulations at the national, local or FMU levels;
- developing national or subnational (e.g. provincial/state) forestry standards;
- developing best management practices for experimental or model forests;
- assisting private forest owners to develop FMU management plans;
- evaluating regulatory compliance and effectiveness; and
- regulating wood-harvesting quotas.

Stakeholder involvement

Nearly all respondents indicated that they make efforts to engage stakeholders in C&I activities. A variety of means are being employed, including the establishment of committees, roundtables and dialogues at the national, state/provincial and local levels. Many countries consider that the meaningful involvement of stakeholders, while often challenging, is essential for the effective use and uptake of C&I. A number of European and Montreal Process countries emphasized that stakeholder participation is a basic principle of their wider forest management planning, assessment, reporting and regulatory processes.

Challenges encountered

Nearly all countries reported facing challenges in the use of C&I. The major challenges across the five C&I processes were:

- limited financial and technical resources, especially for collecting data on social and environmental indicators[9];
- poor stakeholder understanding of the concept and purpose of C&I (including confusion between C&I and certification); and
- conflict among stakeholders on the use and management of forest resources.

ITTO producers also noted a lack of political commitment as a serious constraint, while European and Montreal Process respondents identified multiple levels of forest authorities (e.g. federal, state and local) as a frequent challenge. Other challenges were more country-specific and included issues related to land tenure, limited forest mandates, a lack of intersectoral coordination, agricultural incursions into forests, and the presence of armed groups in forests.

Some respondents had encountered challenges with process-level C&I themselves. These included indicators that were redundant, unsuitable or irrelevant to national or FMU circumstances, or were overly complex or impractical to use, especially by indigenous peoples and local communities and small FMU operators. It was also noted that C&I sets that had been unchanged for many years would benefit from review and update to take into account country experiences in using C&I, as well as global trends and developments such as those related to climate change and bioenergy.

Impacts of C&I on SFM

In general, forest authorities have not undertaken formal assessments to determine the impacts of

9 While all responding countries can report on some indicators, very few countries can report on all indicators.

C&I uptake on forest operations. The views of experts responding to the government questionnaire varied between and sometimes within countries. Despite financial, technical, political and other challenges, 59% of respondents considered that C&I had appreciably improved forest management practices, as follows:

- great improvement in SFM: 13% of respondents, six countries (three ITTO producers)[10];
- moderate improvement in SFM: 46% of respondents, twelve countries (six ITTO producers);
- slight improvement in SFM: 22% of respondents, five countries (one ITTO producer);
- no improvement in SFM: 17% of respondents, five countries (one ITTO producer); and
- not known: 2% of respondents (one response from one country).

The general view was that C&I had contributed to SFM by providing a framework or basis for:

- developing a common global understanding of SFM and in turn catalyzing improved forest policies, programs and strategies;
- increasing awareness and appreciation of non-timber forest benefits and values;
- improving and expanding forest monitoring and assessment;
- developing management plans and standards and monitoring compliance;
- communicating trends in forest conditions to policymakers and the public;
- communicating with and engaging stakeholders; and
- improving forest databases and inventories and systems for collecting, managing, retrieving, updating and analyzing data.

Among the countries reporting that C&I had had little or no impact on SFM, the reasons given included challenges affecting C&I uptake; the greater attractiveness of market-oriented certification; a longstanding tradition of SFM; and unique national circumstances that limited C&I relevance (e.g. the restriction of timber harvesting to plantations).

Innovative applications of C&I

Survey responses revealed that countries are using C&I frameworks in innovative ways that have had indirect positive impacts on SFM. Examples include using C&I to identify forest research needs and priorities, develop education initiatives and prepare environmental assessments and management plans for forest-related projects.

One country has used C&I as a basis for creating a conservation bank to generate sustainable financing to conserve unique forests. Under this innovative program, commercial enterprises, non-governmental organizations (NGOs) and other entities can purchase certificates representing 100 m^2 of forest protection and rehabilitation. Commercial benefits accrue to companies indirectly in the form of brand imaging to consumers and the recognition of corporate social responsibility.

Overview of stakeholder survey results

Twenty-four survey responses were received from the following stakeholders:

- eight tropical timber-harvesting companies managing 2 million ha of natural forest in Bolivia, Brazil, Cameroon, Ghana and Malaysia (Sarawak);
- four industry associations with 760 members representing at least 10 million ha of natural forest in Bolivia, Brazil and Malaysia (Sarawak)[11];
- four plantation companies managing 222 500 ha in Australia, Bolivia, Ecuador and Mexico;
- one national NGO (Forests for People and Community Development – FPCD) working with community production forests in Papua New Guinea;
- two family forest owner associations – the International Family Forest Alliance (IFFA), whose member organizations represent 25 million families that own an estimated 20–25% of the world's forests, primarily in Europe and North America, and the Danish Forest Association, an IFFA member; and

10 Some countries with multiple respondents are represented in more than one group, reflecting differing views within a country.

11 Two associations could not provide figures on the area of forest represented by their members.

- five national/regional forest certification programs covering 94 million ha in Australia, Brazil, Cameroon, Malaysia and North America.[12]

Despite their small number, these respondents represent a broad cross-section of forest stakeholders, as well as a significant area of forest; they provide a picture of C&I awareness and use that may well reflect the experiences of stakeholders more widely, particularly in the tropics.

Harvesting in natural tropical forests (companies and industry associations in Bolivia, Brazil, Cameroon, Ghana and Sarawak)

- All forestry operations are required to be planned and carried out under approved FMPs, often consistent with SFM. Other requirements may apply as well.
- Most operators are familiar with the ITTO C&I and, depending on the country, with the ATO/ITTO PC&I and the Tarapoto C&I. Many had been involved in government discussions on C&I. Several had benefited directly or indirectly from ITTO-sponsored C&I training.
- One large association has used ITTO's C&I to train forest managers and workers and to establish university curricula.
- Many operators are certified under the Forest Stewardship Council (FSC) and use FSC principles and criteria for MAR. For some, FMU C&I paved the way for certification. Certified operators generally have less need for FMU C&I, although one continues to use them to assess high-conservation-value forests and forest protective functions.
- A number of uncertified operators reported using FMU C&I for MAR. Others expressed interest in receiving C&I training, in some cases as a step towards certification.

Harvesting in tropical plantations (Australia, Bolivia, Ecuador and Mexico)

- All forestry operations are required to be carried out under approved FMPs. Other internal and external procedures/standards/controls often apply.
- Most operators are certified by the FSC or the Programme for the Endorsement of Forest Certification (PEFC), or are in the process of becoming certified.
- Operators generally were unfamiliar with C&I, including FMU C&I.

Community forestry (PNG)

- While FPCD is very familiar with ITTO's extensive work on C&I, it has developed the Indigenous Community Forestry Group Certification Scheme based on PNG's FSC national standards, which are simple to use and reflect the PNG context.

Family forestry (temperate/boreal region)

- Government regulations and programs (e.g. NFPs) apply, but they vary between countries.
- National forest owner organizations are typically involved in developing national FSC or PEFC standards. Many family-based harvesting operations are certified.
- In many countries, family forestry is increasingly oriented towards multiple use, supplementing or occasionally replacing timber harvesting with income from the provision of recreation services and the sale of non-wood products.
- The IFFA uses the pan-European and Montreal C&I frameworks, together with local/traditional knowledge, as guides to promoting SFM, multiple-use approaches and locally controlled forests.

Certification programs (Australia, Brazil, Cameroon, Malaysia, Canada–United States)

- All programs use standards based on one or more C&I framework.
- Four programs are endorsed by the PEFC, which is also based on C&I.
- The area of forest certified under these programs has increased significantly in the last decade and is likely to continue to expand.

Trends related to FMU management

The following trends and developments are relevant to C&I, including future C&I applications, reviews and updates.

12 The Australian Forestry Standard, CERFLOR (Brazil), the Cameroon Forest Certification Initiative, the Malaysian Timber Certification Council and the Sustainable Forestry Initiative (Canada and the United States).

Area under SFM

According to the 2010 FRA, which is based on C&I reporting, the area of forest covered by FMPs – an important tool for achieving SFM – has increased steadily and now exceeds 1.6 billion ha globally. This suggests a positive trend towards SFM, recognizing that not all FMPs are implemented effectively and that a forest may be sustainably managed without a plan. Based on additional data collected from over 100 countries, the 2010 FRA concluded that "significant progress has been made over the last ten years" towards SFM. These trends are reflected in SFM Tropics 2011, also based on C&I reporting, which estimated that 52 million ha of production-focused natural tropical forests were under SFM (an increase of 50% since 2005) and 131 million ha were covered by FMPs, compared with 96 million ha in 2005. Both reports noted great improvement in the quality of information provided by countries. While major drivers of these trends include certification and, in the tropics, climate-related initiatives, improved C&I-based forest policy, management and databases are also factors – as noted earlier, more than 80% of government survey responses indicated that C&I had had at least some impact on SFM in their countries.

Certification

The increase in SFM areas has been driven in part by growing demand in key markets for assurances that wood is sourced sustainably. The area of certified forest increased 300% between 2004 and 2012. In 2012, an estimated 10% of all forests (350–400 million ha) and 20% of production forests were certified under the FSC, PEFC or separate national schemes. While most of these forests were in Europe and North America, the area of certified tropical timber-producing forests had also increased to 22 million ha. While this trend toward certification is expected to continue, many tropical FMUs may remain uncertified due to the cost of certification, among other things, which suggests a continuing role for FMU C&I in a number of ITTO producer countries.

CoC and legal verification

CoC certification and legal verification initiatives have arisen in recent years to offer consumer guarantees that wood-based products are sourced legally and sustainably in the country of origin and can be traced back through a "chain of custody". Since 2005, the FSC and the PEFC have issued 30 000 CoC certificates covering a variety of products. While most of these originate in the temperate or boreal regions, tropical forest products are increasingly represented, particularly those products originating in Brazil, India, Indonesia, Malaysia and Viet Nam. The Tropical Forest Foundation (TFF) has introduced CoC and reduced impact logging certification, which can also be a step toward FSC or PEFC certification. Government schemes to address the trade in illegally harvested timber include voluntary partnership agreements between the European Union and exporting countries; amendments to the US Lacey Act that prohibit wood imports sourced illegally in the country of origin; various log-tracking systems, many of which have been introduced by ITTO producers; and procurement policies requiring legality documentation.

Local forest management

About 1 billion ha of forest are privately owned, the majority by some 25 million families primarily in Europe and North America. As noted in SFM Tropics 2011, local control of tropical forests is also on the rise. Since 2002, some 30 million ha of forest have been turned over to indigenous peoples and local communities in the tropics, particularly in Latin America and, to a lesser extent, Asia. Today, 25% of tropical forests are under some form of local control, and this is expected to increase to 30% by 2015. The transition from centralized to local management, and the degraded state of many of the forests involved, can pose significant challenges, some of which might be facilitated by the development of indicators adapted specifically to community circumstances.

Relevant developments and emerging issues

Climate change

Concerns that initiatives to provide developing countries with financial incentives to reduce greenhouse gas emissions from deforestation and forest degradation (REDD) may view and value forests solely or primarily for their carbon storage benefits have led to REDD+, which adds, among other things, "sustainable management of forests" as a possible eligible action. While a positive development, challenges remain in the climate

context to fully apply the SFM concept and to ensure a holistic view of the multiple benefits of forests, of which carbon capture and storage is only one. Since most national and FMU C&I sets include indicators relevant to forest carbon (e.g. growing stock, age structure, annual removals, annual harvest, and forest carbon pools, storage and fluxes), C&I can provide a useful reference for operationalizing SFM aspects of REDD+. In responding to the government C&I survey, a number of countries noted that they consider C&I in the context of carbon calculations and methodologies.

Forest governance

The legal, policy and institutional components of C&I frameworks are a foundation for a new initiative by FAO and the World Bank's Program on Forests (PROFOR) to develop a "framework for assessing and monitoring forest governance" in the REDD+ context. Input from ITTO and other C&I processes in the future development of the framework could be useful.

Biofuels

Rising energy costs and concerns over greenhouse gas emissions from fossil fuels have generated interest in increasing the production of forest-based biofuels as an alternative energy source. Since biofuels are among the products flowing from forests, current sets of national and FMU C&I include a number of indicators relevant to the sustainability of their production (e.g. land available for production, growing stock, value/volume of wood products, wood consumption and the impact of economic use on resource availability). Building on these indicators, the International Energy Agency (IEA) and FAO recently developed PC&I for intensive sustainable woodfuel production and harvesting. Again, input from ITTO and other C&I processes on the future development of these PC&I could be useful.

C&I for other natural resources

In responding to the government C&I survey, some countries noted that they used C&I for SFM as a model for other domestic indicator initiatives, including developing national environmental indicators, as well as C&I frameworks for other natural resources, such as rangelands/grasslands, water resources and minerals. Drawing on these experiences, there may be further scope to use forest C&I frameworks as a reference for other indicator initiatives at various levels.

Biodiversity

Several of the 20 Aichi Biodiversity Targets within the Convention on Biological Diversity (CBD)'s Strategic Plan for Biodiversity 2011–2020 encompass forests. An "indicative list of indicators" has been developed to assess global and national trends towards the targets. Inputs from ITTO and FAO could help identify measurable forest-related indicators based on national C&I data aggregated in SFM Tropics 2011 and the 2010 FRA. It would also advance joint work under the March 2010 memorandum of understanding between ITTO and the CBD, which includes a focal area on "examining opportunities for harmonized reporting on sustainable use and conservation of tropical forests".

C&I collaboration

There has been significant recent collaborative work among C&I processes, including the International Seminar on Challenges of SFM, co-hosted by Indonesia and Japan (Tokyo, March 2011), the Regional Workshop on Using C&I to Improve Forest Monitoring Capacity and Promote SFM in Latin America, co-hosted by Chile and the United States (Valdivia, Chile, April 2011), and the Joint Workshop of the Montreal Process, ITTO, FOREST EUROPE and FAO, hosted by Canada (Victoria, Vancouver, October 2011). These meetings underscored the value of C&I in helping address the above global issues and have led to a process to develop a "joint forest resources questionnaire" to streamline and rationalize national reporting for SFM Tropics, FRAs and regional forest assessments.

Key conclusions

The following conclusions are drawn from survey responses, which together represent a broad cross-section of countries and stakeholders, as well as from ITTO ex-post evaluations of C&I projects in Asia and recent international forest assessment reports and C&I collaborative meetings.

- C&I have helped countries and the international community to understand and operationalize the evolving concept of SFM since ITTO pioneered C&I in the early 1990s.

- Differences among countries in terms of forest governance structures, ownership patterns, existing policy frameworks and forestry traditions, as well as capacity issues, affect how countries use and apply C&I.
- While process-level C&I provide a common reference framework for participating countries, it is often useful for countries to step-down or otherwise adapt internationally developed C&I to reflect national or FMU conditions and circumstances, for example by developing country or FMU-specific C&I.

Forest monitoring, assessment and reporting

- ITTO producers, often with ITTO support, and other countries have made progress in using C&I for MAR, which is reflected in improved forest inventories and databases, systems of data collection and analysis, and information available at the national, subnational and FMU levels.
- Trends at the national and FMU levels observed in data generated through the monitoring of indicators have helped officials and FMU managers identify weaknesses in forest management and make adjustments needed.
- Improvements in the quality, coverage and consistency in the data provided by countries based on C&I has led to more comprehensive regional and international forest assessments as reflected in, among others, SFM Tropics 2011 and FRA 2010. Countries using C&I for MAR tend to be well-positioned to respond to external forest-related reporting requests.

Contribution to SFM

- While the effect of C&I on SFM varies by country, C&I have had an overall positive impact and have contributed in a variety of ways, sometimes significantly, to improved forest management and the expansion of the area of forest under SFM.
- C&I have increased awareness of forest benefits beyond timber/fiber production and highlighted the importance of policy and management frameworks that integrate the economic, social and environmental values of forests.
- The impact of C&I on SFM has generally been greater in countries that have incorporated C&I approaches, with stakeholder involvement, into laws, policies, programs, strategies, guidelines and/or standards governing forest practices.
- FMU-level C&I in particular have provided a basis for a number of ITTO producers, often with ITTO support, to formulate, approve and monitor compliance with FMPs, best management practices, and concession contracts, agreements and permits.
- Innovative applications of C&I in the areas of research, education, training, conservation financing and environmental assessments have also had positive impacts on SFM in some countries.
- C&I have contributed to (and in many cases provided a basis for) forest certification, which has expanded significantly in response to market demands for sustainably and legally harvested products. FMU C&I applications have helped private operators move towards certification.

Challenges encountered

- Despite progress in operationalizing C&I, all countries, particularly tropical producers and other developing countries, face challenges in applying C&I due to insufficient capacity, commitment, policy frameworks and stakeholder engagement.
- The nature and extent of the challenges vary by country. Some challenges can only be addressed internally by raising the priority of forests on national agendas. Others can be facilitated through enhanced international cooperation, partnerships and collaborative C&I initiatives.
- Strengthening the ability of countries to collect data and report on indicators, and to integrate C&I into policies and programs at operational levels, will continue to be important for SFM decision-making in many regions.
- Existing sets of C&I may present challenges for some users. FMU indicators in particular may benefit from a review of their suitability for use by local communities and small enterprises.

Global developments and emerging issues

- C&I are playing a role in wider forest-related developments and issues, including in international initiatives to assess forest

governance in the context of REDD+ and establish PC&I for sustainable woodfuel production. C&I are relevant to the assessment of forest-related aspects of the Aichi Biodiversity Targets.

- At the national level, C&I frameworks are relevant to national forest carbon calculations and to efforts to place carbon values in the broader context of SFM, and they can serve as models for C&I for other natural resources, for example rangelands/grasslands, water resources and minerals.
- The value and contributions of C&I to addressing forest-related global challenges is increasingly evident and warrants further attention, including input from ITTO and other C&I processes.

ITTO leadership

- ITTO has been the single major supporter of C&I training, testing and implementation in producer countries, which can continue to benefit from ITTO assistance. Other potential sources of C&I financing, including FAO, the Global Environment Facility (GEF) and the World Bank, could contribute significantly to national efforts and complement ITTO project support.
- ITTO's C&I would benefit from review and updating to take into account the experiences of member countries, progress made under other C&I processes and relevant trends and developments.
- Given ITTO's long experience with C&I, enhanced collaboration with FAO, other members of the Collaborative Partnership on Forests (CPF) and C&I processes would further promote learning, innovation and cooperative activities and enhance the contribution of C&I to global developments and emerging issues.

Recommendations

To continue and strengthen its work and leadership on C&I and the contribution of C&I to SFM, ITTO may wish to consider the following activities:

- Strengthen the impact of ITTO's C&I in the field.
- Organize additional national and/or sub-regional consultations/workshops involving private stakeholders to focus strategically on C&I uptake at the FMU level, including by identifying specific challenges and ways to meet them, for example, by
  - adapting ITTO C&I to FMU circumstances in individual countries
  - establishing mechanisms for effective stakeholder communication and outreach
  - identifying capacity-building priorities for data collection and analysis
  - establishing demonstration forests for FMU C&I applications
  - exploring linkages between FMU C&I and applicable certification standards, including the TFF's reduced impact logging standard, and the potential for harmonization in individual countries.
- Incorporate C&I uptake into components of ITTO's thematic programs that address MAR and progress toward SFM.

Review ITTO's 2005 national and FMU C&I

- Initiate a process to comprehensively review and, as needed, improve ITTO's C&I based on lessons learned and recent developments, taking into account ITTO's revised guidelines for sustainable management of natural tropical forests and other relevant guidelines, recent indicator updates by other C&I processes, in particular the Montreal Process, the seven thematic elements of SFM, trends in certification and the local control of forests, and relevant global developments and emerging issues related to, among other things, climate, bioenergy and biodiversity. Consideration could be given to
  - streamlining aspects of the national and FMU C&I
  - identifying a core set of indicators for use by local/indigenous community forest managers
  - further elaborating and/or grouping indicators related to sustainable woodfuel production, the contribution of forests to carbon cycles, and forest governance
  - exploring linkages between FMU C&I and certification standards

  - exploring connections among the ITTO, ATO/ITTO and Tarapoto C&I and the feasibility/merits of enhanced convergence.

Strengthen partnerships and collaboration with CPF members and C&I processes

- Engage with the IEA, FAO and PROFOR on their initiatives on assessing and monitoring forest governance in the context of REDD+ (FAO–PROFOR) and to develop PC&I for sustainable woodfuel production (IEA–FAO). Invite representatives to make presentations on the status of these initiatives to the International Tropical Timber Council.
- Work with the CBD secretariat (under the ITTO–CBD memorandum of understanding) and the FAO Forestry Department to identify indicators for the forest-related components of the Aichi Biodiversity Targets, for which C&I baseline information is available through SFM Tropics 2011 and FRA 2010.
- Organize an expert meeting involving FAO, other CPF members, the Montreal Process, FOREST EUROPE and representative countries to
  - finalize the joint forest questionnaire for national reporting for FRAs and SFM Tropics and develop joint data collection schedules and methodologies
  - explore the use of the joint questionnaire as a framework for forest-related reporting to other CPF members
  - exchange experiences and lessons learned on applying C&I at various levels and for various purposes
  - examine how C&I can help countries address developments and emerging issues related to climate, bioenergy, biodiversity, etc.
  - establish a regular framework of communication on C&I and related SFM issues.
- Organize, in collaboration with FAO, the World Bank, the GEF and other CPF members, a joint expert consultation to identify ways to improve and expand international financial, technical and scientific cooperation on C&I, including by tapping into climate-related sources of funding.
- Urge ITTO focal points to facilitate coordination between national forest authorities and focal points for REDD+, the GEF, the CBD and the United Nations Convention to Combat Desertification to highlight the contribution of C&I to forest-related work under the Rio conventions, avoid duplication of effort in the development of forest-related indicators and measures, and generate funding for C&I implementation to complement ITTO support.
- Encourage ITTO members to give greater priority to FMU C&I implementation in ITTO thematic programs and in project proposals financed through the Special Account, as well as in projects financed through bilateral cooperation, FAO and the GEF.

1 INTRODUCTION

Criteria and indicators (C&I) for sustainable forest management (SFM) are arguably the most important and innovative policy instrument for operationalizing the SFM concept (ITTO 2011). Criteria characterize the essential components of SFM, and indicators are ways to measure each component. When monitored over time, C&I "indicate" changes and trends in the biophysical, socioeconomic and policy conditions relevant to SFM.

ITTO pioneered the development of C&I in the early 1990s to assess the condition of natural tropical forests in producer member countries and to help identify weaknesses in forest practices and improvements needed (ITTO 1992). By 2000, based on ITTO's early work and the outcomes of the 1992 Rio Earth Summit, C&I initiatives had been launched around the world.

In the last two decades, ITTO has continued to provide leadership in the review, improvement and implementation of C&I. In this time, the Organization has invested US$30 million in training workshops and projects to build the capacity of tropical timber producer countries to use and apply C&I at the national and forest management unit (FMU) levels, with a view to improving the management of tropical forests, particularly production forests.

Today it is recognized that C&I have contributed to a common understanding within and across countries of what is meant by SFM and that they provide a common approach to assessing forest trends and progress towards SFM as well as a platform for exchanging knowledge, experiences and lessons learned. C&I have also led to identification of the "seven thematic elements of SFM", which are drawn from the criteria common to process-level sets of C&I and form the basis and organizing framework for the periodic global forest resource assessments (FRAs) coordinated by the Food and Agriculture Organization of the United Nations (FAO).

However, little information has been compiled on the ways in which C&I have been operationalized and have contributed to improved forest policies and management practices. To generate such information, ITTO commissioned a study in 2011–2012 to:

- gain a better understanding of the experiences of countries worldwide in using C&I and the impacts of these uses on SFM;
- identify relevant trends, developments and emerging issues; and
- consider ways to strengthen the impact of ITTO's C&I in the field, inform a possible review of ITTO's 2005 C&I, and enhance collaboration among C&I processes.

The study, which forms the basis of this report, was particularly timely in view of the current international context. This includes, among other things, ongoing climate talks focused on REDD+; the recent World Bank–FAO initiative on indicators to monitor and assess forest governance; and efforts by FAO and the International Energy Agency (IEA) to develop principles, criteria and indicators (PC&I) for sustainable woodfuel production, as well as recent collaboration among C&I processes and FAO to streamline and rationalize national reporting for FRA 2015. Also relevant are developments in forest certification, legality verification and locally controlled forestry. The International Year of Forests 2011 highlighted the importance of forests and SFM to people worldwide, while the United Nations Conference on Sustainable Development (Rio+20) in June 2012 marked 20 years since the Forest Principles – the first global consensus on forests – were adopted at the 1992 Rio Earth Summit.

Scope

The study was global in scope and focused on the following five active C&I processes, which together involve some 90 countries with tropical, temperate and/or boreal forests, including many ITTO producers and consumers[13].

Tropical forest processes:

- ITTO C&I for sustainable management of natural tropical forests
- African Timber Organization (ATO)/ITTO PC&I for the sustainable management of African natural tropical forests

13 Most participants in the ATO/ITTO and Tarapoto processes are producer members of ITTO. Many pan-European and Montreal Process countries are ITTO consumer members. Mexico, with significant tropical and temperate forests, is both an ITTO producer and a participant in the Montreal Process.

- Tarapoto Process on C&I for the sustainability of Amazonian forests

Temperate and boreal forest processes:

- FOREST EUROPE's pan-European C&I for SFM
- Montreal Process Working Group on C&I for the conservation and sustainable management of temperate and boreal forests.

The five processes are conceptually similar but differ in their overall structure, level of detail and, most significantly, the elaboration of FMU-level C&I. The three tropical processes have each developed C&I for specific application to FMUs, while the pan-European and Montreal processes have not. The absence of FMU C&I does not mean that countries with temperate or boreal forests have not operationalized C&I in ways that positively affect forest management but that such applications may be indirect.

In addition to variations among C&I processes, individual countries vary widely in the types, extents and distributions of their forests. They also differ significantly in their forest governance structures (e.g. centralized versus decentralized), forest ownership patterns (e.g. one government owner versus millions of small private owners), and existing forest policy frameworks and forestry traditions. These factors, together with capacity issues, affect how countries use and apply C&I.

Methodology

The differences among the five processes, particularly with respect to FMU C&I, mean there is no common framework across processes to assess the field-level use of C&I or their impact on forest practices. This lack of a common FMU structure meant that the study took a broad approach so that it could take into account the different ways in which countries operationalized C&I through national or subnational forest policies, programs and regulations that directly or indirectly affect forest management at the field/FMU level.

Various options were considered for gathering information about how C&I are being used and their impacts on forest practices in a diversity of tropical, temperate and boreal countries. Based on consultations with the ITTO secretariat, it was decided that the most effective and efficient way to obtain factual information for a wide range of countries and C&I users was through general questionnaires. In an effort to reach multiple stakeholder groups while avoiding undue complexity in survey design, two surveys were developed. These targeted, respectively:

- government officials with responsibilities at the national or subnational (e.g. state/provincial, regional and local) levels for forest policy, planning, regulation and/or management; and
- private/non-government forest stakeholders, including companies, associations and other operators subject to government policies and regulations, as well as forest certification programs.

Between March and December 2011, the ITTO Executive Director circulated the government survey to officials in some 40 countries, including 32 ITTO member countries for which contact information was provided by ITTO focal points. Simultaneously, the private/non-government survey was circulated to stakeholders in 70 countries, including virtually all ITTO members, based on contact information drawn from ITTO and consultant databases, internet searches and personal contacts. While survey responses provide the foundation for the study, the consultants also drew on ex-post evaluations of ITTO-funded C&I projects in Asia, recent regional and international forest assessments (e.g. Blaser et al. 2011; FOREST EUROPE, UNECE and FAO 2011; FAO 2010a), a set of 25 "success stories" (ITTO 2011), and the outputs of recent C&I process collaborative meetings.

Report structure

This report is organized in seven chapters. Chapters 2 and 3 provide background and context on the early evolution of, and more recent developments in, C&I and closely related initiatives. Chapter 4 focuses on responses to the government survey and also considers relevant aspects of ITTO ex-post evaluations of C&I projects. Chapter 5 reviews responses to the private/non-government survey. Chapter 6 considers global trends and other developments and emerging issues relevant to C&I. Chapter 7 presents conclusions and recommendations for future work.

2 EARLY EVOLUTION OF C&I FOR SFM: 1990–2000

Development of C&I initiatives

Emerging concept of SFM

The 1980s saw growing international concern about the loss of tropical forests due to conversion for agriculture and cattle ranching and over-exploitation for timber production, as well as the degradation and dieback of temperate and boreal forests due to acidic deposition by airborne pollutants from industrial operations ("acid rain"). From this concern emerged a new awareness of forests as important renewable resources providing a wide range of essential goods and ecosystem services at the local, national and global levels, including timber, food, fuel, shelter, clean water, soil stabilization, flood control, carbon sequestration, biodiversity, medicines, livelihoods and employment.

This awareness gave rise to a paradigm shift from sustained-yield forestry to the concept of SFM – managing forests as ecosystems that provide multiple economic, social and environmental benefits. With this shift came the need to assess and monitor trends in a range of forest conditions and to generate information that could be used by decision-makers to move forest policies and practices towards SFM. This led to the development of C&I for SFM.

ITTO's pioneering work

ITTO's members represent about 90% of the trade in tropical timber and 80% of the world's closed tropical forests. The Organization was a pioneer in promoting the concept of SFM as early as 1987, when it commissioned a survey of forest management in the tropics. This led to the publication of *No Timber without Trees* (Poore et al. 1989), which concluded that only about 1 million hectares (ha) of tropical forests were being managed "sustainably". To assist tropical producer members to improve the situation, in 1990 ITTO published *Guidelines for the sustainable management of natural tropical forests* (ITTO 1990), which outlined a comprehensive set of principles and possible policy and operational actions to achieve SFM.

In March 1992, ITTO published *Criteria for the measurement of sustainable tropical forest management* (ITTO 1992), which contained the first internationally agreed "criteria for sustainability" and "examples of indicators" to assess forest conditions and help identify weaknesses in forest management practices and the improvements needed. These C&I were neutral (rather than normative) in nature. The criteria sought to characterize SFM, while the indicators were ways to measure the criteria. By collecting data on indicators, countries could establish critical baseline information on forest conditions and management and subsequently determine trends in those conditions that could be used to inform and adjust forest policies and practices.

ITTO (1992) provided a definition of SFM and outlined two sets of C&I, one to assess sustainability at the national level and the second to assess sustainability at the FMU level. The national-level C&I (five criteria, 27 examples of indicators) provided a broad picture of forest management at the country level. The FMU C&I (six criteria, 23 examples of indicators) were designed to assess and report on forest management practices and to feed into analyses at the national level by aggregating data collected for FMU-level indicators. FMU C&I were considered important in the ITTO context because, in many tropical producer countries, the government has authority over the management and use of forests, including granting timber concessions to companies for specific FMUs.

ITTO (1992) also recognized that the two sets of C&I were "neither exhaustive not exclusive" and that their use should take into account and be adapted to the specific circumstances of a given country or FMU. While the ITTO C&I focused on sustainability in the context of tropical timber production and did not include, for example, all the ecological functions of forests, this early initiative set the stage for later work on C&I for SFM.

In 1993 ITTO published *Guidelines for the conservation of biological diversity in tropical production forests* (ITTO 1993) and subsequently organized national workshops and financed projects to help producer countries apply the two sets of C&I and related forest management and biodiversity conservation guidelines. In 1998, based on experiences gained by ITTO members and lessons learned from other C&I processes, especially

the pan-European and Montreal processes, ITTO developed revised *Criteria and indicators for the sustainable management of natural tropical forests* (ITTO 1998a) at the national and FMU levels covering the full range of forest goods and services. These revised sets of C&I were accompanied by the *Manual for the application of criteria and indicators for the sustainable management of natural tropical forests* (ITTO 1998b) to assist producers with C&I uptake and implementation.

Rio Earth Summit

In June 1992, the United Nations Conference on Environment and Development (UNCED), known as the Rio Earth Summit, gave global recognition to the contribution of forests and SFM to sustainable development when it adopted the *Non-legally binding authoritative statement of principles for a global consensus on the management, conservation and sustainable development of all types of forests,* as well as Chapter 11 of Agenda 21 on combating deforestation. Paragraph 2(b) of the Forest Principles states that: "Forest resources and lands should be sustainably managed to meet the social, economic, ecological, cultural and spiritual human needs of present and future generations".

The Forest Principles and Chapter 11 of Agenda 21 also contain language pointing to the importance of forest assessments. Forest Principle 12(a) notes the need to strengthen "forest inventories and assessments carried out by national institutions which take into account … biological, physical, social and economic variables … of sustainable forest management". Chapter 11 recognizes the need to formulate "scientifically sound criteria and guidelines for the management, conservation and sustainable development of all types of forests". The phrase "all types of forests" reflected an important political dimension of the Rio negotiations, specifically that all countries – including developed countries – were equally responsible for sustainably managing their forests.

Temperate and boreal forests

As a response to the Rio Earth Summit's Forest Principles, in September 1993 Canada hosted, in Montreal, the International Seminar on Sustainable Development of Boreal and Temperate Forests. The seminar had broad participation from countries worldwide and focused specifically on the development of C&I as a way to characterize and measure SFM at the "national level" in temperate and boreal forest countries. Drawing on ITTO's early work, the seminar's output provided the basis for the pan-European and Montreal Process C&I initiatives.

C&I

The pan-European C&I were developed under the auspices of the Ministerial Conference on the Protection of Forests in Europe (MCPFE), a high-level policy process launched in 1990 to address common opportunities and challenges and develop common strategies related to Europe's forests.[14] The MCPFE's work on C&I and other common forest issues was supported by expert-level consultations and a Liaison Unit that rotated with the chairmanship of the MCPFE process. In June 1994, following the second MCPFE in Helsinki in 1993, European forest experts adopted six pan-European criteria and 27 quantitative indicators that considered the ecological functions of forests and their socioeconomic benefits. Descriptive indicators were added in January 1995 to capture aspects that could not easily be quantified, in particular the legal, policy and institutional frameworks needed to achieve the conditions of SFM expressed in criteria 1–6.

Taken together, the pan-European C&I constitute a common policy instrument for countries to monitor, evaluate and report progress toward SFM. Like the ITTO C&I, they were designed to generate information about trends in forest conditions and management. In contrast, however, they have solely a regional and national focus: early on, forest experts opted not to develop FMU-level C&I, which were not considered feasible given the significant differences among countries in terms of forest governance and administrative structures (e.g. centralized versus decentralized) and ownership patterns (e.g. many small family forest owners). Nevertheless, to assist countries in operationalizing the pan-European C&I, experts developed the Pan-European Operational Level Guidelines for Sustainable Forest Management (PEOLG) as a voluntary framework for C&I implementation.

The third MCPFE (Lisbon 1998) formally adopted the six pan-European criteria and endorsed the associated indicators "as a basis for international

14 MCPFE signatories are Europe's 46 countries and the European Commission. Ministerial conferences are held every 3–5 years to establish national and regional SFM commitments.

reporting and for development of national indicators". The third MCPFE also endorsed the PEOLG, and ministers further committed to "promote the development and implementation of national C&I using the pan-European C&I as a reference framework".

Montreal Process C&I

In 1994 in a parallel effort, Canada, Japan, the Russian Federation (also part of the MCPFE) and the United States launched the Montreal Process Working Group on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests (referred to here as the Montreal Process Working Group or the Montreal Process). The Montreal Process Working Group was supported by a liaison office hosted by Canada; it expanded rapidly to include nearly all countries outside Europe with significant temperate or boreal forests.

In February 1995, eleven countries[15] adopted the Santiago Declaration, affirming their commitment to conserve and sustainably manage their forests and endorsing a set of seven criteria and 67 indicators as guidelines for policymakers to assess national forest trends and progress toward SFM. The C&I provided a common assessment framework for reporting on all forests in a country, including public and private forests, natural forests, plantations and tropical forests, and promoted harmonized approaches to SFM, while allowing flexibility for adaptation to national circumstances. Taken together, the C&I were considered to provide an implicit definition of SFM.

The early implementation efforts of the Montreal Process were facilitated by a technical advisory committee, coordinated by the United States, which in 1996 developed *Technical notes on implementation of the Montreal Process criteria and indicators.* Comparable with Europe's PEOLG, the technical notes stated the rationales for indicators, suggested approaches to measurement, and provided a glossary of terms to facilitate data collection and reporting by countries. In 1997, the Montreal Process Working Group issued the *First approximation report of the Montreal Process*, which analyzed, based on national submissions, the status of data availability in countries to report on each Montreal Process indicator.

15 Uruguay became the12th member of the Montreal Process in 1996.

The Montreal Process C&I were largely comparable with the pan-European C&I and similarly designed for use as a reference by countries in assessing and reporting on forest trends at the national level. The Montreal Process did not elaborate FMU-level C&I for the same reasons as the pan-European process and also because "FMU" was not a term that could be applied meaningfully in all participating countries. The Montreal Process differed from the pan-European initiative primarily by identifying a specific criterion and set of indicators to capture the contribution of forests to global carbon cycles; and addressing the legal, policy and institutional framework needed for SFM as a separate criterion rather than through descriptive indicators applicable to other criteria.

Tarapoto Proposal for the Amazon

In February 1995, a regional workshop was convened in Tarapoto, Peru, under the auspices of the Amazon Cooperation Treaty Organization (ACTO)[16] to develop C&I suitable for Amazonian forests. Building on experiences in the ITTO, pan-European and Montreal processes, participants recommended adoption by respective governments of the *Tarapoto proposal on criteria and indicators for sustainability of Amazonian forests*. Like the ITTO C&I, the Tarapoto Proposal included C&I for use at the national level (seven criteria, 47 indicators) and the FMU level (four criteria, 23 indicators). The proposal also included an international criterion on the "economic, social, and environmental services performed by Amazonian forests", with seven associated indicators. As with other sets of C&I, the Tarapoto Proposal was seen as a tool to monitor and assess forest trends and generate information for use by decision-makers.

CIFOR field-testing of C&I

In 1994, the Center for International Forestry Research (CIFOR) initiated a project to field-test the application of C&I in seven locations in Austria, Brazil, Côte d'Ivoire, Germany and (with funding from ITTO) Indonesia. Using ITTO's 1992 C&I and the principles and criteria (P&C) of the Forest Stewardship Council (FSC) as umbrellas, CIFOR identified a list of C&I to test in each location, with a view to developing a methodology for identifying a minimum number

16 Based in Brasilia, ACTO was established to carry out provisions of the 1978 Amazon Cooperation Treaty, which promotes "joint actions toward harmonious development of the Amazon Basin".

of cost-effective and reliable C&I for each site that would form a coherent picture of how forests were being managed. Building on initial results, CIFOR subsequently expanded the project to include test sites in Cameroon, Gabon, India and the United States, with special emphasis on biodiversity and social C&I, which early findings showed were not as well understood as traditional economic indicators (e.g. growing stock and annual wood removals).

In 1998, based on the project's findings, CIFOR developed a "generic" set of C&I, which ranged from broad principles to verifiers, and produced the *Criteria and indicators toolbox series* with inputs from ITTO, FAO and others. The toolbox included eight manuals as well as decision-support software to guide users in assessing the sustainability of natural and planted forests for a wide variety of FMU situations, from community forestry to large-scale timber and pulpwood plantations.

ATO PC&I

In 1995, in response to increasing threats of boycotts of African tropical timber in European markets and with financial support from the European Union (EU) and technical collaboration with CIFOR, the ATO developed an initial set of PC&I for the sustainable management of African forests. Five principles relating to forest policy and management were supported by 26 criteria and 60 indicators. In 1998 the ATO initiative was field-tested by CIFOR in a number of locations in Gabon.

FAO–UNEP–ITTO-supported regional initiatives

Between 1995 and 2000, FAO took the lead in facilitating the development of C&I in the following four regions:

- **Dry-zone Africa.** In November 1995, FAO and the United Nations Environment Programme (UNEP) organized a regional expert meeting in Nairobi to launch the Dry-zone Africa Process. The 28 participating countries identified an initial set of seven criteria and 47 indicators for the sub-Saharan region, which were further developed in November 1997. In December 1998, FAO and UNEP organized an expert meeting on national-level C&I for the Southern African Development Community countries. After detailed reviews, the Southern African Development Community initiative agreed on seven criteria and 48 indicators in the framework of the Dry-zone Africa process. In 2000, based on recommendations from regional and national workshops and expert meetings, the availability of indicator data and national capacities to collect data, FAO prepared *Practical guidelines for the assessment and measurement of criteria and indicators for sustainable forest management in dry-zone Africa* to facilitate C&I implementation.
- **Near East.** In October 1996, FAO and UNEP organized a regional expert meeting in Cairo to initiate a C&I process for the Near East. The 30 participating countries endorsed seven national-level criteria and 65 indicators for further development at the sub-regional and national levels. Follow-up meetings of national C&I coordinators and national workshops reviewed the applicability of the C&I to individual countries, as well as data availability and national capacities for data collection and analysis. Based on these meetings, in 2000 FAO published *Practical guidelines for the assessment and measurement of criteria and indicators for sustainable forest management in the Near East region*.
- **Central America.** The Lepaterique Process was initiated in Central America following recommendations of an expert meeting organized by the Central American Council of Forests and Protected Areas and FAO in Tegucigalpa, Honduras, in January 1997. Experts from the seven Central American countries identified a set of four criteria and 40 indicators for use at the regional level, and eight criteria and 53 indicators for use at the national level. Subsequently, a number of national training workshops, seminars and validation exercises were conducted to review the applicability and availability of indicator data.
- **Dry forests of South Asia.** In December 1999, FAO, UNEP, ITTO, India and the United States convened, in Bhopal, India, the Workshop on the Development of National-Level C&I for the Sustainable Management of Dry Forests in Asia/South Asia. The nine participating countries identified eight national-level criteria and 49 associated indicators suitable for the region and developed an initial two-year plan of action.

Status of C&I by 2000

Nine C&I initiatives/processes

By 2000, nine regional and international C&I initiatives or processes had been launched involving some 150 countries worldwide (Table 1). Several countries were participants in more than one process: for example, many participants in the ATO/ITTO, Tarapoto and Lepaterique initiatives were also producer members of ITTO, and the Russian Federation was associated with both the pan-European and Montreal initiatives.

As indicated in Table 1, all nine initiatives had developed C&I that could be used or adapted by countries as tools to monitor and report on forest trends and progress towards SFM at the national level. Some initiatives also included criteria and/or indicators for application at the FMU level (ITTO, ATO/ITTO, Tarapoto Proposal), the regional level (Europe, dry-zone Africa, Lepaterique) or the international level (Tarapoto Proposal).

Despite these variations in the scale at which the C&I were to be applied, as well as differences in the number of the criteria and indicators developed, the various sets of C&I associated with the nine processes were, in the main, conceptually comparable. They all reflected a holistic approach to forests as ecosystems with multiple values beyond wood and fiber production. Criteria represented the essential economic, social and environmental elements of SFM, and indicators provided ways to measure the criteria.

IPF/IFF proposals for action

The international community as a whole first formally embraced the concept of C&I for SFM in the context of the ad hoc open-ended Intergovernmental Panel on Forests (IPF), which was established in 1995 under the auspices of the Commission on Sustainable Development to develop recommendations for the United Nations General Assembly Special Session on "Rio plus five" in June 1997. The Panel's mandate included an agenda item on "scientific research, forest assessment and the development of criteria and indicators for sustainable forest management".

In August 1996, with a view to informing the IPF discussions on C&I, Finland organized, in collaboration with FAO, ITTO and the United States, the Intergovernmental Seminar on Criteria and Indicators for Sustainable Forest Management (ISCI) in Helsinki. Drawing on the ISCI's results, the IPF agreed at its final session in February 1997 to several "proposals for action" on C&I, which encouraged countries to:

- prepare and begin implementation of national-level C&I for SFM, recognizing that field-testing will be needed to gain experience for the further development and refinement of C&I;
- promote the use of internationally, regionally, sub-regionally and nationally agreed C&I as a framework for promoting best forest practices and facilitating SFM;
- formulating and implementing C&I on a cross-sectoral basis with the full participation of all interested parties;
- including C&I in national forest programs; and
- establishing and clarifying links between national-level C&I and C&I at the subnational and FMU/operational levels, and promoting C&I compatibility at all levels.

Table 1: Summary of nine C&I initiatives/processes, as of 2000

C&I initiative/process	Year launched	Initiated by	Countries	C&I sets/levels
ITTO	1992	ITTO	33 producers	National, FMU
Pan-European	1994	MCPFE	46+ the European Commission	Regional/national
Montreal Process	1994	Canada, Japan, Russian Federation, USA	12	National
ATO/ITTO	1995	ATO/ITTO	13	National, FMU
Tarapoto Proposal	1995	ACTO	8	National, FMU, International
Dry-zone Africa	1995	FAO, UNEP	28	Regional/national
Near East	1996	FAO, UNEP	30	National
Lepaterique (Central America)	1997	FAO, Central American Council of Forests and Protected Areas	7	Regional, National
Asia/South Asia	1999	FAO, ITTO, UNEP, India, USA	9	National

The IPF also:

- encouraged countries not yet participating in international/regional C&I initiatives to become involved as soon as possible;
- urged countries and international organizations to work toward a common understanding of the concepts, terms and definitions used in C&I initiatives, mutual recognition among sets of C&I as tools to assess national forest trends, and methods for the collection, assembly, storage and dissemination of indicator data;
- recommended that FAO and other international organizations draw on the commonalities among C&I initiatives to improve consistency in forest reporting; and
- requested the Convention on Biological Diversity (CBD) to ensure that its work on biodiversity indicators would be consistent and complementary with existing forest C&I initiatives.

The IPF was succeeded in 1997 by the Intergovernmental Forum on Forests (IFF), which in February 2000 concluded that C&I were important tools for reviewing, monitoring and reporting on the state of and trends in all types of forests and for assessing progress towards SFM. The IFF encouraged countries to further develop and implement C&I to this end and requested FAO, ITTO, the United Nations Development Programme (UNDP), UNEP and the World Bank to develop harmonized reporting formats incorporating C&I to synthesize national forest information, reduce reporting burdens and increase the timeliness and consistency of reporting. Like the IPF, the IFF proposals for action focused on national-level C&I, which all nine processes had developed in some form.[17]

Emergence of forest certification programs

The interest in SFM that led to the development of C&I to assess and monitor forest trends also spurred discussions among non-governmental organizations (NGOs), timber traders and governments to develop recognized norms or performance standards that could be used to "certify" that harvested timber came from well-managed forests. Forest management certification gained momentum following the Rio Earth Summit, largely in response to increasing consumer demands in niche markets, especially in Europe, for guarantees that wood imports were sustainably sourced. This led to the development of numerous – sometimes competing – certification schemes during the 1990s.

FSC

The first certification program to become operational was the FSC, which was established in 1993 as an independent non-profit NGO. In 1994, the FSC issued the *FSC principles and criteria for forest stewardship*, which set forth nine principles and some 50 criteria designed as standards for managing primarily wood production forests in both the tropics and the temperate/boreal region consistent with SFM. A tenth principle with associated criteria was added in 1996 to cover plantation management.[18]

While the FSC P&C addressed many of the same biological, social, economic and policy elements identified in various sets of C&I, they were normative in nature, rather than neutral. In the FSC system, forestry operations had to meet the P&C to be FSC-certified as sustainably managed, which then entitled forest owners/managers to use the FSC logo in market promotions. A key feature of the FSC program was that determinations of satisfactory performance according to the P&C were not made by the FSC itself but rather by independent "third-party" entities accredited by the FSC and contracted privately by forest owners/managers to evaluate their forestry operations. The first FSC certificates were issued in 1995–96. By 1998, 10 million ha of forest had been FSC-certified.

Standards organizations and the forest products industry

Industry was also looking at standard-setting that could be applied in the forest context. The International Organization for Standardization (ISO) 14000 series addressed various aspects of environmental management (e.g. environmental management systems, labelling, performance evaluation, communication, auditing and lifecycle analysis) that were not forestry-specific but which could be applied by forest companies as a reference framework. In 1993, at the request of the

17 The full text of the IPF and IFF proposals for action is available at www.un.org/esa/forests.

18 The FSC P&C were updated in 2002.

Canadian forest products industry, the Canadian Standards Association (CSA) began a process to develop a standard for SFM in Canada consistent with ISO 14000. Three years later, "CSA 1996" was established as a voluntary standard for SFM focused on four performance-based components: commitment, public participation, management systems and continuous improvement. CSA 1996 required the forecasting and monitoring of a broad suite of indicators linked to Canada's national C&I, which were based on the Montreal Process C&I.

In 1994, in a parallel effort, the American Forest and Paper Association (AF&PA) launched the Sustainable Forestry Initiative (SFI), which set forth principles and implementation guidelines based on the Montreal Process C&I. Like CSA 1996, the SFI enshrined the performance goal of "continuous improvement" in forest management practices. As a condition of membership, AF&PA member companies (which at the time included some of world's largest forest products companies) had to commit to the SFI principles and guidelines.

These early initiatives differed from the FSC in that they reflected a programmatic approach to improving forest management (rather than "hectare-by-hectare" standards), which set objectives for companies to work toward in managing often-extensive timberlands. In addition, the SFI did not originally involve third-party evaluations. Companies were expected to report progress and improvements in forest management in annual reports and other relevant public documents. In 1998, the SFI separated from the AF&PA and became established as an independent certification standard-setting body for timber-harvesting operations in Canada and the United States.

National schemes and the PEFC

A number of tropical timber-producing countries also began developing national certification schemes early on. Notable among these initiatives was the Brazilian Program of Forest Certification (CERFLOR); efforts by the Indonesian Ecolabeling Institute (Lembaga Ekolabel Indonesia), some of which were supported by ITTO; and the Malaysian Timber Certification Council's early work on the Malaysian Timber Certification Scheme (MTCS) based on ITTO's C&I.

As national certification schemes began to proliferate worldwide in the late 1990s, there were increasing concerns about competition among schemes and the related burden placed on timber producers in meeting the requirements of different schemes. To facilitate a harmonized approach, the Programme for the Endorsement of Forest Certification (PEFC) was founded as a non-profit, non-governmental umbrella organization for endorsing national certification systems. The PEFC established "sustainability benchmark criteria" drawn from, among other places, the pan-European C&I, the ITTO C&I and related guidelines, and the ATO/ITTO PC&I as the framework for endorsing national schemes, with an initial focus on Western Europe. National systems tailored to national priorities and conditions would be endorsed by the PEFC if an independent, qualified third party determined them to be consistent with the PEFC's sustainability benchmarks.

C&I versus certification

The parallel development of C&I and forest certification, together with their shared goal of promoting and operationalizing SFM and their shared vocabulary (e.g. "criteria"), led to confusion about the two policy instruments. C&I were conceived and designed as neutral assessment tools, which, if monitored over time, would generate information on forest-related trends that could inform and improve forest policies and management decisions at the national and FMU levels. In contrast, certification schemes were designed as performance standards, against which specific forest production operations at the FMU level could be evaluated. The application of C&I was voluntary, while certification, if achieved by a forest owner/manager, involved meeting mandatory requirements. These distinctions between C&I and certification were sometimes blurred and not always well understood.

The involvement of governments in certification was also a subject of debate during the 1990s. Some countries actively promoted and facilitated the development of national certification standards. Others advocated official "mutual recognition" among certification schemes or, alternatively, intergovernmental action, for example through ITTO, to develop globally agreed certification standards to bring coherence to the proliferation of national schemes. Yet other countries maintained that certification was a consumer-driven market tool in which governments had no role. This last became the general view in ensuing years.

3 DEVELOPMENTS IN FIVE C&I PROCESSES SINCE 2000 AND RELATED GLOBAL DEVELOPMENTS

Developments in five C&I processes

Since 2000, the five C&I processes on which this study focuses have taken steps to improve their sets of C&I based on experiences gained by participating countries in operationalizing C&I. Table 2 summarizes developments in these processes in the period 2000–2012, which are also described below.

ITTO C&I

In the last decade, ITTO has continued to be a leader in the field of C&I. Its successive action plans[19] have consistently identified the promotion, strengthening and implementation of C&I as an important strategy to improve information about, and the management of, the tropical timber resource base in member countries. ITTO's extensive work on C&I has encompassed both policy initiatives and capacity-building projects and activities, described below.

Policy work. In 2000, the ITTO secretariat initiated a highly successful collaboration with the ATO to refine the early ATO PC&I and merge them with ITTO's 1998 version of its C&I. This led to the development in 2001, and publication in 2003, of the *ATO/ITTO principles, criteria and indicators for the sustainable management of African natural tropical forests* (ATO/ITTO 2003).

In 2005, following a comprehensive review of the lessons learned in implementing the 1998 C&I and relevant international developments, ITTO issued the *Revised ITTO criteria and indicators for sustainable management of tropical forests, including a reporting format* (ITTO 2005), in which national- and FMU-level C&I are closely integrated. Seven criteria apply at both the national and FMU levels, as do 48 of the 57 indicators. Nine indicators apply only at the national level (e.g. "contribution of forestry to GDP"). A standardized, user-friendly reporting format with instructions was also developed to facilitate data collection and reporting by producer members. This format simplified and replaced the 1998 manual for the application of C&I (ITTO 1998b).

In 2006, ITTO published the *Status of tropical forest management 2005* ("SFM Tropics 2005"; ITTO 2006). This was the first comprehensive report focused on the status of forest management in tropical timber-producing countries and was based largely on national reporting from 21 of ITTO's 33 producer member countries using the ITTO C&I. The second report, SFM Tropics 2011 (Blaser et al. 2011), was released in June 2011 and was based on national reporting from 32 ITTO producers. While the capacity of countries to provide data on indicators continues to vary widely, the quality of information provided by many countries was significantly better for the 2011 report, indicating that countries had been able to strengthen forest inventory and data-collection systems, in some cases with ITTO support.

In 2009, ITTO updated its biodiversity guidelines in collaboration with the International Union for Conservation of Nature (IUCN) and published the *ITTO/IUCN guidelines for the conservation and sustainable use of biodiversity in tropical timber production forests* (ITTO/IUCN 2009). These guidelines drew on ITTO's revised indicators for biodiversity conservation. At the time of writing, ITTO was also in the process of updating its guidelines for the sustainable management of natural tropical forests, first published in 1992. The International Tropical Timber Council considered a revised version of the guidelines at its 49th session in November 2013, and these were expected to be adopted by the end of 2014.

Capacity-building. In the last 15 years, primarily through voluntary contributions from donor members, ITTO has spent US$30 million in C&I-related training workshops, projects and activities, the majority since 2000, making ITTO the world's largest investor in C&I for SFM. In terms of training, ITTO has organized three regional training workshops in Africa, Asia and Latin America as well as 27 national workshops, including in several ATO and Tarapoto countries, to assist producer countries to use C&I. Each national workshop engaged 30–50 key stakeholders actively involved in forest management, including representatives from government, the private sector,

19 Libreville Action Plan 1998–2002, Yokohama Action Plan 2002–2006, and ITTO Action Plan 2008–2011.

communities, NGOs and research institutions. To date, 1300 individuals have been trained in the application of C&I through ITTO-funded workshops.

In addition, ITTO has funded a number of projects designed primarily to assist countries to test and apply C&I and prepare baseline and national reports on progress towards SFM using C&I. Ex-post evaluations of completed projects in Indonesia, the Philippines and Thailand (discussed in Chapter 4) have helped identify lessons learned that could inform future projects.

ATO/ITTO PC&I

As noted above, ITTO and ATO collaborated in developing the *ATO/ITTO PC&I for sustainable management of African natural forests* (ITTO 2003), which integrated ITTO's 1998 C&I and ATO's 1995 PC&I. The ATO/ITTO PC&I comprise a detailed set of criteria, indicators and sub-indicators, which are framed by the following four principles:

1. Sustainable forest use and maintenance of the multiple functions of forests are a high political priority.

Table 2: Summary of developments in five C&I processes since 2000

C&I process	Year	C&I activity
ITTO	2000+	ITTO organizes 27 national and 3 regional C&I training workshops and funds C&I projects in member countries worth US$18 million
	2001	ITTO collaborates with ATO to develop the ATO/ITTO PC&I
	2005	ITTO publishes *Revised ITTO C&I for sustainable management of tropical forests* with reporting format and instructions
	2005, 2011	ITTO publishes SFM Tropics reports based on national C&I reporting
	2009	ITTO publishes the *ITTO/IUCN guidelines for conservation and sustainable use of biodiversity in tropical production forests*
	2010	ITTO initiates process to revise its 1992 guidelines for the sustainable management of natural tropical forests
FOREST EUROPE	2002	Experts adopt improved pan-European indicators for SFM (PEOLG remains unchanged)
	2003, 2007, 2011	State of Europe's forests reports, based on national C&I reporting, are published
	2009	MCPFE is renamed FOREST EUROPE
	2011	Ministers agree to negotiate a legally binding agreement on forests in Europe (which may address C&I)
Montreal Process	2000–2011	ITTO funds US$1.3 million for tropical-forest C&I projects in China and Mexico
	2003	Montreal Process Working Group issues Quebec City statement and adopts Vision for the Montreal Process: 2003–2008
	2003, 2009–2010	Members produce national forest reports based on the Montreal Process C&I and overview reports illustrative of national trends
	2007–2008	Montreal Process Working Group adopts revised indicators for the conservation and sustainable management of temperate and boreal forests
	2008–2009	Montreal Process Working Group adopts revised technical notes to facilitate data collection on revised C&I and also adopts the Montreal Process Strategic Action Plan 2009–2015
ATO/ITTO	2000+	ITTO organizes 1 regional and 9 national C&I workshops and funds US$3 million in C&I projects in ATO/ITTO countries
	2001	ATO and ITTO develop ATO/ITTO PC&I for sustainable management of African natural tropical forests
	2003	ITTO publishes the ATO/ITTO PC&I
Tarapoto Process	2000+	ITTO organizes 1 regional and 7 national C&I workshops and funds US$3.2 million in C&I projects in Tarapoto Process countries
	2000	ACTO ministers launch Tarapoto Process on C&I for the sustainability of Amazonian forests
	2001	ACTO regional meeting identifies 8 criteria and 15 indicators as "very applicable" for Amazon countries
	2004	ACTO & FAO launch US$400 000 project on validation of 15 "very applicable" indicators
	2005	ACTO regional meeting reviews progress on validation project
	2007	ITTO/ACTO initiate discussions on potential project to harmonize Tarapoto and ITTO C&I
	2011	Preliminary report on potential harmonization is presented at the 47th session of the International Tropical Timber Council
	2012	ACTO regional meeting considers potential harmonization

2. The FMU, designated for whatever form of land use, is sustainably managed with a view to supplying the required goods and services.
3. The main ecological functions of the forest are maintained.
4. According to the importance and intensity of forest operations, the FMU manager contributes to the improvement of the economic and social well-being of workers in the FMU and local populations.

Principle 1 encompasses five criteria, 33 indicators and 45 sub-indicators for use at the national level. Combined, principles 2–4 include 15 criteria, 57 indicators and 100 sub-indicators at the FMU level. Unlike other C&I sets, the ATO/ITTO PC&I are normative in nature, setting forth policy and management objectives that should be met, or conditions that should exist, with respect to forests. They are essentially detailed performance standards, not unlike certification P&C.

Since the development of the ATO/ITTO PC&I, ITTO has provided about US$3 million to assist African member countries with testing and implementation. This has included organizing national training workshops in several countries, as well as one regional workshop, and financing projects in Cameroon, the Republic of the Congo, Gabon and Togo. Among other things, these projects have assisted countries to develop national C&I based on the ITTO and ATO/ITTO processes and to test and apply national- and FMU-level C&I. For a number of large concessionaires operating in the region, the application of the ATO/ITTO PC&I has also helped pave the way for FSC certification.[20]

Tarapoto Process

Ministers of foreign affairs of ACTO member countries formally launched the Tarapoto Process on Criteria and Indicators for Sustainability of Amazonian Forests in 2000. This began a process of national consultations to identify and definitively adopt the most widely applicable of the C&I contained in the 1995 Tarapoto Proposal. In June 2001, ACTO convened a regional meeting in Tarapoto, Peru, which identified seven of the twelve Tarapoto Proposal criteria and 15 of the 77 proposed indicators as "very applicable" to, and measurable by, all Amazon countries. Another 18 indicators were identified as generally applicable to member countries.

The seven "very applicable" criteria retain three national-level criteria and three FMU-level criteria from the original Tarapoto Proposal, as well as the international criterion on services provided by Amazonian forests at the global level. The 15 very applicable indicators were designated as priorities for field-testing.[21] In May 2004, with support from FAO, ACTO initiated a two-year US$400 000 regional project to validate 15 priority sustainability indicators for the Amazon to assist Tarapoto countries in testing the indicators. Beginning in 2005, ACTO hosted follow-up meetings to review the progress of the validation project.

Since 2000, ITTO has provided about US$3.2 million to assist ITTO/Tarapoto countries with C&I implementation. This has included organizing national training workshops in seven countries, as well as one regional workshop, and financing projects in Bolivia, Brazil, Colombia, Ecuador, Guyana and Peru. In 2007, ITTO and ACTO initiated discussions on a joint project to consider a process of harmonizing the priority Tarapoto C&I with the 2005 ITTO C&I. After a period of building political support for the project, ITTO funded a consultancy to make proposals on harmonization. A preliminary report was presented at the 47th session of the International Tropical Timber Council in November 2011. An ACTO regional meeting in Suriname considered the proposals in May 2012 and consultations are on-going.

Pan-European C&I

In October 2002, following a review of lessons learned using the early pan-European C&I framework, forest experts adopted the *Improved pan-European indicators for sustainable forest management*, which include 35 quantitative and 17 qualitative indicators for the six pan-European criteria; these were formally endorsed by the fourth MCPFE, which was convened in Vienna, Austria, in 2003. The improved indicators continue to address the policy/institutional framework for SFM

20 The ATO secretariat in Libreville recently ceased to function. The Ministry of Forests of Gabon is currently assessing ATO services and future support needs.

21 A paper on the Tarapoto Process was presented at the International Expert Meeting on Monitoring, Assessment and Reporting on Progress toward SFM hosted by Japan in November 2001 as a UNFF country-led initiative. The paper is available at www.rinya.maff.go.jp.

through qualitative indicators covering the overall policies, institutions and instruments of SFM, as well as policies, institutions and instruments specific to the six pan-European criteria.

FOREST EUROPE (and the MCPFE, its predecessor) published reports on the state of Europe's forests in 2003, 2007 and 2011. These reports were organized and structured according to the pan-European criteria and improved indicators and based primarily on information provided by Europe's 46 countries in response to a national-level survey. Successive reports have been increasingly robust because countries have progressively increased their capacity to collect information on indicators. The 2011 report provides "a comprehensive, up-to-date description of the status and trends since 1990 of forests and forest management in Europe", and "aims to stimulate sound policy decisions of forest and forest-related issues ... by providing objective and harmonized data for FOREST EUROPE signatories". The report identifies four major challenges and opportunities for forest policy in Europe – climate change, wood for energy, the conservation of forest biodiversity and the contribution to a green economy – and contains, for the first time, an assessment of progress towards SFM.

A comprehensive external review of the effectiveness of the MCPFE process was completed in 2009. It noted, among other things, that the work on C&I was one of the most concrete and far-reaching outcomes of the pan-European policy process.

At the 6th MCPFE, which was co-hosted by Norway and Spain in Oslo in June 2011, ministers agreed to begin negotiations on a legally binding agreement on forests for Europe. If C&I are addressed in some way in the final text, this could be the first time in which the application of C&I is required rather than voluntary. Negotiations of the legally binding agreement were expected to be concluded by June 2013, after which the text was to be considered by ministers at an extraordinary FOREST EUROPE ministerial conference.[22]

Montreal Process

The Montreal Process Working Group remains exclusively focused on C&I. While the emphasis is on temperate and boreal forests, the Montreal Process C&I continue to apply to areas of tropical forests in member countries, notably Australia, China, Mexico and the United States. In 2003, members issued their first "country forest reports" based on the 1995 C&I. While the Montreal Process Working Group did not prepare a comprehensive assessment report covering all C&I based on the 12 country reports (primarily because the 12 countries do not constitute a coherent region of contiguous countries such as in Europe, for example), illustrative forest trends from national reports were highlighted in the *First Montreal Process overview report 2003*. Member countries also adopted the *Quebec City statement* in 2003, reaffirming their commitment to the Montreal Process and setting forth the *Vision for the Montreal Process: 2003–2008.*[23]

In 2006, the Montreal Process Liaison Office moved from Ottawa, Canada, to Tokyo, Japan. In 2007, after a series of workshops and based on experiences in preparing the 2003 country reports, the Montreal Process Working Group endorsed a revised set of 44 indicators for criteria 1–6. In 2008, ten revised indicators were adopted for Criterion 7 (legal, institutional and economic framework for forest conservation and SFM). In 2008–2009, the technical advisory committee[24] completed the revised *Technical notes on implementation of the Montreal Process criteria and indicators* to assist forest practitioners in collecting data on revised indicators. The technical notes specify rationale statements for each indicator, suggest approaches to measurement, and provide a glossary of terms and other information to facilitate data collection and reporting.

In 2009–2010, countries completed a second round of national forest reports within the framework of the Montreal Process C&I using the revised indicators for criteria 1–6. The reports showed strengthened capacity by participating countries to collect useful data on a wider array of indicators. Drawing on the national reports, the Montreal Process Working Group developed a second overview report, *A vital process for addressing global forest challenges: the Montreal Process 2009,* which highlights the significant role the Montreal Process had played in helping member countries respond to key challenges and opportunities for

22 Further information on the pan-European C&I and FOREST EUROPE is available at www.foresteurope.org and www.forestnegotiations.org.

23 Mexico has significant areas of tropical forests and joined ITTO as a producer member in 2004.

24 Coordinated by New Zealand since 2003.

Table 3: Comparison of current C&I sets used by five C&I processes

C&I process	Principles		Criteria			Indicators			Sub-indicators	
	National	FMU	National	FMU	Global	National	FMU	Global	National	FMU
ITTO	-	-	7	7	-	57	48	-	-	-
ATO/ITTO	1	3	5	15	-	33	57	-	45	100
Tarapoto	-	-	3	3	1	6	5	4	-	-
Pan-European	-	-	6	-	-	52	-	-	-	-
Montreal	-	-	7	-	-	54	-	-	-	-

forests related to climate change, biodiversity conservation, bioenergy production and water security. During this period, the Montreal Process Working Group also adopted the *Montreal Process strategic action plan: 2009–2015* to guide its work and communicate its objectives and priorities to member countries, domestic stakeholders and the international community.[25]

The Montreal Process Working Group fosters bilateral and regional collaboration among member countries, but it does not offer project funding to assist with the application of C&I. Since 2000, ITTO has provided about US$1.3 million to assist China and Mexico with C&I-related activities involving their tropical forests. FAO has also supported C&I projects involving the Southern Cone countries of Argentina, Chile and Uruguay, as well as Paraguay. In recent years, FAO has provided support aimed at strengthening national capacities to implement SFM and at developing and implementing a regional C&I cooperation strategy to generate information and data needed by government and non-government users and stakeholders to improve forest monitoring, evaluation and decision-making.

Comparing current sets of C&I

Developments in C&I processes since 2000, including C&I revisions and updates and collaborative work among processes, have generally led to increased comparability and convergence in the various sets of C&I. This reflects a common understanding of the concept and role of C&I as a tool to help countries monitor and evaluate trends on a range of forest biophysical and management conditions and progress toward SFM. Within this shared conceptual framework, the C&I used by processes differ somewhat in their overall structures and levels of detail and complexity.

Table 3 compares the C&I sets produced by the five processes. It shows that the ITTO, pan-European and Montreal Process national-level C&I are generally comparable, each having 6–7 criteria and 52–57 associated indicators. The Tarapoto Process C&I are the most streamlined because they represent priority C&I that are applicable to, and measurable by, all ACTO countries. By contrast, the ATO/ITTO PC&I are highly detailed and include both macro principles and a large number of sub-indicators.

All three tropical processes (i.e. ITTO, ATO/ITTO and Tarapoto) continue to identify FMU-level C&I; these vary widely in number, however, ranging from three FMU criteria with five indicators in the Tarapoto Process to the ATO/ITTO's 15 FMU criteria with 157 indicators and sub-indicators. The Tarapoto Process also continues to include an international criterion and associated indicators covering forest services at the global level.

Annexes 2 and 3 of this report further illustrate variations in the structure and content of collective sets of C&I identified by the five processes.[26] Annex 2 provides a cross reference among the national-level criteria, together with the "seven thematic elements of SFM" (discussed below). Annex 3 provides a cross reference of the FMU-level criteria used by the three tropical C&I processes, with the ATO/ITTO FMU principles displayed for context. While there is general convergence on the nature of the essential components of SFM (e.g. biodiversity, forest production and a policy framework), these components are not all represented at the same level or in the same way. For example:

- The ATO/ITTO and Tarapoto C&I address some SFM components in the context of FMU-level criteria and/or indicators rather than as national-level criteria.

25 Further information on the Montreal Process is available at www.montrealprocess.org.

26 The cross references in annexes 2 and 3 are illustrative only. Differences in the structures of C&I sets do not lend themselves to precise comparisons.

- The Tarapoto Process captures the contributions of forests to the global carbon cycle as an indicator under its international criterion rather than in its national-level C&I.
- The pan-European C&I continue to capture the policy and institutional framework needed for SFM through indicators rather than as a separate criterion or principle.
- ITTO applies the same seven criteria (and many of the same indicators) at both the national and FMU levels.
- A number of the ATO/ITTO FMU criteria are addressed by ITTO as FMU indicators.

Also evident are distinctions in how some national and FMU C&I are formulated. For example, ITTO's criteria are formulated as topics (e.g. biodiversity). The Montreal, pan-European and Tarapoto criteria are formulated as broad goals using somewhat different language (e.g. conservation of biological diversity; maintenance, conservation and appropriate enhancement of biological diversity in forest ecosystems; conservation of forest cover and biodiversity). As already noted, the ATO/ITTO PC&I are formulated as standards or conditions to be met rather than as neutral measures.

The differences in the overall structure, detail and language among the sets of C&I used by the five processes, while sometimes significant, mostly do not reflect conceptual differences. On the whole, the set or sets of C&I used by each process comprise the same basic building blocks of SFM, although with differing arrangements and areas of emphasis.

The seven thematic elements of SFM

CICI 2003

In November 2000, CIFOR, FAO, ITTO, the International Union for Forest Research Organizations (IUFRO) and UNEP organized an expert consultation to review the progress made in developing and applying C&I worldwide and to consider opportunities for greater collaboration among processes. Among other things, the meeting recommended convening a global conference on C&I; subsequently, in February 2003, the International Conference on the Contribution of Criteria and indicators for Sustainable Forest Management: The Way Forward was convened by FAO, ITTO, Finland and the United States, hosted by Guatemala. A major outcome of the conference, which is known as CICI 2003, was the identification of "seven thematic areas" of SFM based on the criteria common to several C&I processes, together with the recommendation that FAO use these thematic areas in the overall framework of its FRAs.[27]

Building on the outcome of CICI 2003, in March 2003 the 16th session of the FAO Committee on Forestry (COFO 16) recommended that FAO strengthen its role in facilitating collaboration among C&I processes, noting in particular the seven common thematic areas of SFM.

UNFF

The United Nations Forum on Forests (UNFF) was established in 2000 as a subsidiary body of the Economic and Social Council of the United Nations, with universal membership, to promote implementation of the IPF/IFF proposals for action and provide a forum for continued policy development and dialogue among governments. The Collaborative Partnership on Forests (CPF) was formed to support the UNFF and to enhance cooperation and coordination among the many international organizations with significant forest-related mandates.[28]

The high-level segment of the second session of the UNFF in March 2002 issued the *Ministerial declaration and message to the World Summit on Sustainable Development* (WSSD), in which ministers responsible for forests at the UNFF stressed, among other things, the important role of C&I for SFM. The substance of the ministerial message, including the reference to C&I, was incorporated in the Johannesburg Plan of Implementation (paragraph 45) adopted by the WSSD, which was held in September 2002.

Two major, interrelated themes at the fourth session of the UNFF (UNFF 4), held in May 2004, were the implementation of the IPF/IFF proposals for action on forest-related monitoring, assessment and reporting (MAR), and C&I for SFM. Drawing on the outcomes of CICI 2003 and COFO 16,

27 The report of CICI 2003 is available at www.fao.org/docrep.

28 The CPF includes the executive heads of 15 international secretariats: FAO Forestry Department (chair), CIFOR, CBD, GEF, ITTO, IUCN, IUFRO, UNDP, UNCCD, UNEP, UNFCCC, World Agroforestry Centre and the World Bank.

UNFF 4 "acknowledged the following seven thematic elements of SFM, which are drawn from the criteria identified by existing C&I processes and offer a reference framework for SFM":

- Extent of forest resources
- Forest biological diversity
- Forest ecosystem health and vitality
- Productive functions of forests
- Protective functions of forests
- Socioeconomic functions of forests
- Legal, policy and institutional framework.

As illustrated in Annex 2, this acknowledgment represented a significant step towards a common global view of the essential aspects of SFM and how to assess progress. UNFF 4 also called for improved linkages between the periodic FRAs coordinated by FAO and existing C&I processes to improve the information base for forest-related MAR, as well as greater efforts to harmonize forest-related definitions to facilitate national progress toward SFM, clarify reporting requests, minimize inconsistencies in the information provided, and reduce reporting burdens.

The seven thematic elements and C&I are enshrined in the Non-legally Binding Instrument on All Types of Forests[29] (the "Forest Instrument") adopted in 2007 by the UNFF and the United Nations General Assembly as the first global agreement on forests since the 1992 Forest Principles. Section V of the Forest Instrument, "National policies and measures", states that: "To achieve the purpose of this instrument, and taking into account national policies, priorities, conditions and available resources, Member States should:

- "Consider the seven thematic elements of SFM, which are drawn from the criteria identified by existing C&I processes, as a reference framework for sustainable forest management and, in this context, identify, as appropriate, specific environmental and other forest-related aspects within those elements for consideration as C&I for SFM [paragraph b]
- "Further develop and implement C&I for SFM that are consistent with national priorities and conditions" [paragraph g].

29 The full text of UNFF resolution 4/3 and the Non-legally Binding Instrument on All Types of Forests are available at www.un.org/esa/forests.

FRA 2005 and 2010

In response to COFO 16 and UNFF 4, FAO adopted the seven thematic elements of SFM as the FRA reporting framework, beginning with FRA 2005, to provide a holistic perspective on the state, management and use of the world's forests. FRA 2010, the most comprehensive global assessment to date, is organized according to the seven thematic elements. The report examines the current status and recent trends in over 200 countries for 18 key "variables" that are linked to the thematic elements and correspond closely to indicators from various sets of C&I. The report also considers another 70 variables, also largely linked to the thematic elements.[30]

Because the seven thematic elements are based on common criteria, and the main FRA variables are linked to indicators, the FRAs are essentially global C&I assessment reports. The analysis is based on data provided by countries through questionnaires and thematic studies closely associated with C&I and supplemented by remote sensing surveys and national reporting. Countries already using C&I for their national reports are well positioned to respond to FAO's questionnaires.

CPF task force on streamlining reporting

In 2002, in response to country concerns about the proliferation of forest-related reporting requested by CPF member organizations, the CPF established the CPF Task Force on Streamlining Forest-related Reporting to seek ways to facilitate national forest reporting and develop common approaches for forest-related data and information collection, storage and dissemination. The task force has since agreed to work towards guidelines for national forest-related reporting to CPF members according to the seven thematic elements of SFM. The UNFF and CBD secretariats have articulated that, in principle, the forest information submitted to them in national reports could be organized according to the seven thematic elements. At its 8th session in 2009, the UNFF requested the UNFF secretariat to collaborate with FAO, other CPF members and C&I processes to develop a format for reporting to the UNFF on progress towards SFM and the implementation of the Forest Instrument.

30 The 2010 FRA is available at www.fao.org/forestry/fra/fra2010. Table 1 of that report shows the 18 key variables (indicators) analyzed for the seven thematic elements of SFM. Reporting on the contribution of forests to carbon cycles is incorporated in thematic element 1 (extent of forest resources).

Collaborative work on C&I

As early as 1995, FAO and ITTO organized an expert meeting to consider ways to harmonize key concepts and terms used by the ITTO, pan-European and Montreal C&I processes. While progress was made toward a common understanding of basic terms (e.g. forest type, criterion and indicator), it was generally concluded that more experience in implementing C&I was needed before the merits of harmonization could be determined. This early collaboration continued with a number of scientific meetings[31] and the policy meetings already mentioned, which were co-organized by ITTO, including the ISCI conference hosted by Finland in 1996, the FAO-hosted expert consultation in 2000, and CICI 2003 hosted by Guatemala.

ITTO and FAO followed up CICI 2003 in March 2004 with an expert consultation in Cebu City hosted by the Philippines to improve the common understanding of C&I concepts and approaches and communication among processes. In June 2006, ITTO, FOREST EUROPE (then MCPFE) and the Montreal Process, together with FAO, the United Nations Economic Commission for Europe and the United States Forest Service, organized the Inter-Criteria and Indicators Process Collaboration Workshop, hosted by Poland. That meeting considered issues common to the three processes, including how to make C&I more visible and useful to policymakers and stakeholders, and stressed the need to demonstrate practical national and subnational C&I applications.

Following the inter-process workshop in Poland, collaboration on C&I slowed until 2011, when three important collaborative meetings were convened. These are discussed below.

International Seminar on Challenges of SFM (Tokyo, March 2011)

In March 2011, Japan and Indonesia co-hosted the International Seminar on Challenges of Sustainable Forest Management, which was organized by ITTO, FOREST EUROPE and the Montreal Process as a UNFF country-led initiative.

31 These include the International Conference on Indicators for SFM organized by Australia, IUFRO, CIFOR and FAO in 1998 in Melbourne to foster stakeholder input to advance the development of scientifically based indicators, and the Conference on C&I for SFM at the FMU Level organized by Ecofor and the European Forest Institute on behalf of IUFRO and under the auspices of FAO, CIFOR and CATIE in Nancy, France, in 2000.

The meeting, which had 170 participants from international organizations, NGOs, the private sector and 30 countries, reviewed the development and implementation of policy tools and instruments for SFM, including C&I and certification. The co-chairs' summary concluded, among other things, that:

- Significant progress had been made in the development and application of C&I in the last two decades, which had contributed to the identification of the seven thematic elements of SFM.
- C&I have provided (1) a common tool to monitor, assess and report on forests and forest management; (2) a common understanding of SFM for integrating multiple forest values into forest policies and management; (3) common ground for working out shared objectives and collaboration with stakeholders; and (4) a common platform for exchanging knowledge, experiences and lessons learned and fostering collaboration and cooperation among associated countries.
- C&I frameworks have provided a substantial basis for the development of forest certification schemes, the identification of indicators to monitor and assess forest governance, and the evolution of global forest assessments, notably FAO's FRAs.
- Indicators may vary according to the characteristics of forests, such as forest types, and the scales at which they are applied, while criteria are basically common across geographic regions and scales.
- Countries, particularly developing countries, often face difficulties in implementing C&I at the field level due to insufficient capacity, commitment and funding.

The co-chairs' summary also:

- urged countries to make further efforts to undertake concrete actions to implement SFM on the ground through, among other things, improved forest-related MAR;
- encouraged C&I processes and associated countries to
  - strengthen efforts to operationalize their C&I, including prioritizing the development of an efficient monitoring system and the capacity to operate it

  - periodically review and update indicators, taking into account the reporting needs emerging from issues related to forest governance, forest and land degradation, climate-change mitigation and adaptation and biodiversity conservation, as well as scientific and technical developments;

- encouraged C&I processes, working with FAO, ITTO and the UNFF, to improve the consistency of forest-related reporting among processes and with other forest reporting mechanisms to reduce the burden on countries and promote systematic and integrated forest reporting;
- invited countries and international organizations to continue to support C&I processes and participating countries, in particular developing countries, in operationalizing and further improving C&I frameworks; and
- invited the Rio conventions to take existing C&I frameworks into account in developing new forest-related monitoring and reporting mechanisms and to collaborate with C&I processes and the CPF Task Force on Streamlining Forest-related Reporting to this end.

Workshop on Using C&I to Improve Forest Monitoring Capacity and Promote SFM in Latin America (Valdivia, Chile, April 2011)

In April 2011, Chile's National Forest Corporation (CONAF) and the United States Forest Service organized the Workshop on Using C&I to Improve Forest Monitoring Capacity and Promote Sustainable Forest Management in Latin America. The 30 participants included forestry experts from Argentina, Chile, Guatemala, Honduras, Paraguay, the United States and Uruguay, as well as from FAO and the Center for Tropical Agricultural Research and Higher Education (CATIE), which is based in Costa Rica.[32]

The meeting looked at similarities and differences in reporting efforts and explored opportunities for improving reporting at the national and regional levels. While participants raised a number of issues associated with data gathering and reporting, they also noted significant progress in capacity-building in recent years in some countries. For example, the three Southern Cone countries – Argentina, Chile and Uruguay – had made progress in developing the forest inventory information needed for sustainability reporting. They had also identified and refined a core set of 16 indicators that integrated Montreal Process and FRA data requirements.

Joint Workshop of the Montreal Process, FOREST EUROPE, ITTO and FAO (Victoria, Canada, October 2011)

In October 2011, Canada organized and hosted this joint workshop with 30 representatives of FOREST EUROPE, FAO, ITTO and the Montreal Process with the aim of streamlining global forest reporting and strengthening collaboration among international C&I processes.[33] The workshop agreed to develop a "collaborative forest resources questionnaire" that will serve as a basis for reporting to FAO for FRA 2015 and to ITTO for its next edition of SFM Tropics, as well as reporting by respective members to FOREST EUROPE and the Montreal Process Working Group. The joint questionnaire was finalized at subsequent meetings hosted by the United States and Japan and will be distributed globally as part of FAO's 2015 FRA reporting package.

The joint workshop stressed the need for future collaboration among the three C&I processes and FAO to:

- develop joint data-collection schedules and methodologies between FAO and the three C&I processes;
- identify similarities and differences among the three indicator sets, with a view to developing a core set of indicators for FRA 2015;
- examine how C&I can help countries deal with emerging issues; and
- establish a regular framework for communication on C&I and related SFM issues.

The workshop also issued a joint statement, "Looking after the world's forests and maintaining their services", which included the following key messages:

32 ITTO was unable to be represented at the workshop, which took place shortly after the Sendai earthquake and tsunami.

33 The full report of the joint workshop is available at www.mpci.org and www.itto.int.

- Since UNCED, the Montreal Process, ITTO, FOREST EUROPE and the FAO FRA had used sophisticated C&I frameworks for reporting on forest-related environmental, social and economic aspects.
- The seven internationally recognized thematic elements of SFM are a basis for monitoring and reporting and for revealing challenges and demonstrating progress on forest conditions and SFM.
- The four bodies (FOREST EUROPE, FAO FRA, ITTO and the Montreal Process):
  - were confident that their experiences and successes had relevance to other organizations and processes interested in tracking environmental changes and reporting on sustainable development;
  - recognized the value of working with other processes and organizations to avoid the proliferation of monitoring requirements and associated reporting burdens;
  - recognized that their knowledge and experience in tracking and reporting on forest conditions and trends were of value and relevance to emerging issues such as climate change, bioenergy and water; and
  - invited other entities interested in forest-related data, evaluation or expertise to work with them to further improve forest-related data collection and reporting. The four bodies saw this as the best way to address emerging issues and to ensure the greatest lasting contributions from sustainably managed forests to sustainable development worldwide.

4 GOVERNMENT USES/APPLICATIONS OF C&I AND THEIR IMPACTS

This chapter focuses primarily on responses to the government survey by officials with responsibilities at the national or subnational (e.g. state, provincial and local) levels for forest policy, planning, regulation and management. The chapter provides an overview of responses received; reviews the experiences of countries in using and applying C&I and responses to the challenges encountered in using C&I; and looks at the impacts of C&I on forest management practices. Parts of the chapter are organized according to two groupings of the five C&I processes: ITTO producers, including ATO/ITTO and Tarapoto Process participants (tropical forests)[34]; and FOREST EUROPE and Montreal Process countries (temperate/boreal forests).

As a whole, survey responses, supplemented by other evidence, provide a good overall picture of the range of C&I applications and impacts. However, applications and impacts are highly specific to countries due to a number of factors. The following discussion should be understood in that context.

Overview

Designing a global survey for government officials was challenging, given the differences among C&I processes and sets, in particular regarding FMU-level C&I, which the pan-European and Montreal processes have not developed, as well as the performance-based nature of the ATO/ITTO PC&I. Such differences meant there was no common framework across processes to assess the field-level use of C&I or their impacts on forest practices. The lack of FMU-level C&I does not mean that temperate/boreal forest countries have not applied C&I in ways that have had a positive effect on forest management; it is possible that there have been indirect applications, with impacts on forest practices achieved by stepping down or otherwise integrating national-level C&I into forest policies or management regulations, rather than by the direct use of field-level C&I.

In addition to variations among C&I processes and sets of C&I, countries within and across processes differ significantly in their forest-related governance structures, ownership patterns and existing forest policy frameworks and forestry traditions, all of which affect how countries use and apply C&I. For example:

- In many countries, government regulation of public and private forests is a national responsibility. In other countries, including federations, the authority to regulate forests rests largely at the subnational level (e.g. state/province) or is distributed over multiple levels of government (e.g. national, state/province, county and municipality).
- In some countries, the government is the sole or principal owner or trustee of forests and oversees their management directly or through government-awarded concessions, licences or contracts. In other countries, forests may be owned and managed by millions of companies, communities, families and individuals, often in small parcels.
- Countries differ in the relationship or distinctions made between government and private operations. In some countries, timber and other forest industry boards facilitate private-sector activities and may have quasi-governmental status. In other countries, forest management agencies operate as state-owned timber-producing private companies, or the government and private sector may be completely separate.
- Countries differ widely in the extent and distribution of forest area and diversity of forest types, which can affect how forests are managed and C&I are used. In some countries, for example, timber harvesting occurs in both natural/native and planted forests. In others, native forests are totally protected and timber production is limited to plantations.

To address adequately the differences among countries and particularly among C&I processes, a draft survey was pilot-tested informally with a number of officials involved in the pan-European and Montreal processes to assess the relevance of some questions for countries without FMU-specific C&I. Feedback led to minor modifications in the

34 Although Mexico is an active member of the Montreal Process, its responses are included with ITTO producers.

final survey (see Annex 4), which aimed to take into account C&I differences while avoiding undue complexity in survey design.

Survey respondents

The cooperation and assistance of ITTO members in providing contact information for government officials was essential for gathering information on C&I uses and impacts. Beginning in February 2011, the ITTO Executive Director electronically circulated the survey and a draft list of possible official contacts[35] to each ITTO focal point, requesting that they confirm or update the contact list for their countries. The following members responded to the Executive Director's request or had previously completed the pilot survey:

- ITTO producers – Brazil, Colombia, Côte d'Ivoire, Guatemala, Guyana, Honduras, Malaysia, Mexico, Myanmar, Peru and Togo; and
- ITTO consumers – Canada, China, Finland, Japan, Korea, New Zealand, Norway, Sweden, the United Kingdom and the United States.

Based on information obtained from the FOREST EUROPE Liaison Unit (Oslo) and the Montreal Process Liaison Office (Tokyo), contact information was generated for officials in the following additional countries:

- ITTO consumers – Australia, Austria, Denmark, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Spain and Switzerland; and
- Non-ITTO members – Argentina, Chile, Croatia, Hungary, the Russian Federation, Slovenia, Turkey and Uruguay.

Between March and December 2011, the government survey was circulated to about 100 officials in the above countries.[36] As shown in Table 4, 47 responses were received from officials in 25 countries. The highest number of responses was from Canada (6), followed by Colombia (4), New Zealand (4) and the United States (4). China and Mexico, with both temperate and tropical forests, are active in both the ITTO and Montreal C&I processes. Guatemala and Honduras, both ITTO producer members, have participated in the Lepaterique C&I Process for Central America. The Russian Federation, with the largest forest area in both Europe and Asia (as well as the world), is an active member of both the pan-European and Montreal processes. (Annex 6 presents a list of government survey recipients and respondents.)

Table 5 shows the survey responses by C&I process. Eighteen responses were received from nine ITTO producer countries, including one

Table 4: Responses to the government C&I survey, by country

Country	No. of responses	C&I process	ITTO member
Argentina	1	Montreal	No
Austria	1	FOREST EUROPE	Yes
Brazil	1	ITTO, Tarapoto	Yes
Canada	6	Montreal	Yes
Chile	1	Montreal	No
China	3	Montreal, ITTO	Yes
Colombia	4	ITTO, Tarapoto	Yes
Côte d'Ivoire	1	ITTO, ATO/ ITTO	Yes
Finland	1	FOREST EUROPE	Yes
Guatemala	1	ITTO (& Lepaterique)	Yes
Guyana	1	ITTO, Tarapoto	Yes
Honduras	1	ITTO (& Lepaterique)	Yes
Japan	1	Montreal	Yes
Korea	2	Montreal	Yes
Malaysia	2	ITTO	Yes
Mexico	1	Montreal, ITTO	Yes
New Zealand	4	Montreal	Yes
Norway	1	FOREST EUROPE	Yes
Peru	3	ITTO, Tarapoto	Yes
Russian Federation	1	FOREST EUROPE, Montreal	No
Slovenia	1	FOREST EUROPE	No
Sweden	1	FOREST EUROPE	Yes
Togo	3	ITTO	Yes
UK	1	FOREST EUROPE	Yes
USA	4	Montreal	Yes
25 countries	**47**		

35 The draft contact list was drawn from the ITTO secretariat's database of participants in national and regional C&I training workshops and from information provided by the FOREST EUROPE Liaison Unit and the Montreal Process Liaison Office.

36 The exception was Myanmar, which initially provided 39 contacts, noting that a short list would follow, which remains pending.

associated with the ATO/ITTO PC&I (Côte d'Ivoire), four associated with the Tarapoto Process (Brazil, Colombia, Guyana and Peru) and one associated with the Montreal Process (Mexico). Seven responses were received from seven FOREST EUROPE countries, including five ITTO consumers, and 24 responses were received from ten (of twelve) Montreal Process countries, including six ITTO consumers and Mexico (an ITTO producer).

Table 5: Number of government survey respondents, by C&I process

C&I process	No. of countries	No. of responses
ITTO producers, of which:	9[a]	18[a]
ATO/ITTO	1	1
Tarapoto	4	9
Other producers	4[a]	6[a]
FOREST EUROPE	7[b]	7[b]
Montreal Process	10[a,b]	24[a,b]

Note: a = includes Mexico; b = includes the Russian Federation.

Table 6 shows the distribution of responses received from ITTO producer and consumer members by region and group. A total of 42 responses were received from 19 ITTO member countries, with the highest number from consumers and Latin American producers (twelve responses from seven countries) and the fewest from tropical Africa (Côte d'Ivoire and Togo) and Asia (Malaysia).

Table 6: Number of ITTO respondents to the government survey

ITTO member grouping	No. of countries	No. of responses
Producers – Africa	2	4
Producers – Asia	1	2
Producers – Latin America	7	12
Consumers – EU	4	4
Consumers – non-EU	7	20
Total	**21**	**42**

Respondents were from a mix of national and subnational forest agencies, organizations and institutions. Table 7 shows that the majority were from national forest authorities.

Forest area represented by respondents

Table 8 shows the forest area owned and/or managed by responding entities, the extent of that area that is certified, and the additional forest area regulated by the responding entities (but do not own or manage). Where a country provided more than one response, the areas listed are the total reported for that country. Responding entities own and/or manage 579 million hectares (ha) of private and public forest and regulate another 461 million ha of forests[37], for a total of over 1 billion ha, of which 40% is in the tropics. This represents 25% of the world's forests, many of which are production forests.

As shown in Table 8, over 25% (156 million ha) of the forest owned or managed by respondents are timberlands certified under the FSC, the PEFC and/or an independent national scheme, with the largest area reported for Canada. In many cases, the certified area reflects only a portion of all certified forests in the country. For example, Finland noted that 97% of its forests (21 million ha) were PEFC-certified. Norway indicated that basically all commercially harvested forest was PEFC-certified. Japan noted that about 1.13 million ha of mostly planted forest for commercial timber production were certified under their domestic Sustainable Green Ecosystem Council and/or the FSC.

Government uses/applications of C&I

This section reviews how forest authorities are using or applying C&I. The discussion is largely descriptive due to differences among C&I sets (e.g. regarding FMU C&I) and among countries in terms of forest governance structures. There were also differences and overlaps in the interpretations by respondents of key survey terms (e.g. planning, management, standards) based on their particular national/subnational legal, policy and institutional context and variations in language. The responses are illustrative of the ways in which countries in various regions have operationalized C&I in their forest-related assessments, legislation, policies, plans and programs, recognizing that ITTO producers in Africa and Asia are not well-represented. To the extent that these experiences can be generalized to governments that did not respond to the survey, they provide a cross-section of C&I implementation worldwide.

37 Responding entities from Argentina, Austria, Finland and Mexico do not own, manage or regulate forests but are involved in C&I uses/applications.

Table 7: Types of organization represented by government respondents

Forest agency/organization	ITTO, ATO/ITTO, Tarapoto	FOREST EUROPE	Montreal Process	Total
National ministry/authority	13[a]	5[b]	10[a,b]	28[a,b]
National research organization	-	2	4	6
State/provincial authority	4	-	7	11
Local authority	-	-	1	1
University	1	-	-	1
Total	**18[a]**	**7**	**22**	**47[a,b]**

Note: a = includes Mexico; b = includes the Russian Federation.

Table 8: Area of forests owned/managed and regulated by responding organizations

Process/country	Forest owned/ managed (1000 ha)	Area certified (1000 ha)	Additional forest regulated (1000 ha)
ITTO – Africa			
• Côte d'Ivoire (ATO/ITTO)	4 200	0	0
• Togo	820	0	400
ITTO – Asia			
• Malaysia (Sabah)	3 607	112	0
ITTO – Latin America			
• Brazil (Tarapoto)	100	0	290 000
• Colombia (Tarapoto)	9 338	0	0
• Guatemala	1 835	35	0
• Guyana (Tarapoto)	12 900	0	0
• Honduras	124	114	113
• Peru (Tarapoto)	68 000	*	22 000
FOREST EUROPE			
• Norway	0	-	12 000
• Russian Federation (also Montreal)	114 600	2 600	0
• Slovenia	0	-	1 185
• Sweden	0	-	28 000
• UK	753	753	2 000
MONTREAL PROCESS			
• Canada	244 200	146 000	70 355
• Chile	4 000	0	12 000
• China	6 000	6 000	0
• Japan	7 625	*	17 623
• Korea	1 404	238	0
• New Zealand	5 058	47	1 300
• USA	94 348	0	4 456
Total	**578 912**	**155 899**	**461 432**

* Forests "owned/managed" are partly certified but exact figures on the area certified are not available.

Monitoring, assessment and reporting – ITTO, ATO/ITTO and Tarapoto processes

National, regional and international levels. A number of tropical producer respondents are using C&I as a framework for forest-related MAR at the national level, often building on ITTO training or project support. Some countries have developed their own C&I sets based on the ITTO framework to better reflect national conditions. Togo is in the process of developing national C&I based on the ATO/ITTO PC&I as part of a wider initiative for forest-sector reform to include the development of a national forest policy, a forest action plan and standards for SFM. Brazil and Togo noted that while they do not use C&I to monitor and assess forests, they do report using a C&I framework. Several countries, including Colombia, Guyana and Peru, specifically mentioned using C&I as a framework for regular reporting to relevant regional and international organizations, such as ACTO, FAO and ITTO.

Subnational/FMU levels. Some ITTO producers are using C&I as a framework or basis for MAR at the subnational and FMU levels, again often building on ITTO support. For example:

- In Sabah, Malaysia, information gathered using the ITTO C&I are used as a basis for regular reporting on progress toward SFM at the state, local and FMU levels and are somewhat applied in monitoring and assessing SFM implementation at the FMU and other operational levels.
- In Honduras, ITTO's C&I are used to monitor and assess management plans and operational plans for all forests.
- In Mexico, C&I are used for reporting on forest areas certified under national regulations for SFM or under FSC national standards.
- In Brazil, the ITTO FMU C&I are applied in ITTO-financed projects.
- In Togo, C&I are used in annual reports on technical activities at the subnational and FMU levels.
- Côte d'Ivoire noted that while it does not use C&I as a basis for MAR, a working group has recently been introduced to *Societé de Développement des Forêts* (SODEFOR) to oversee the implementation of C&I development at the FMU level.
- In Colombia, ITTO funded an early project (1998–2001) on the implementation and evaluation of criteria for the sustainable management of natural forests in the departments of Putumayo and Nariño, the results of which have been partially applied.

Monitoring, assessment and reporting – pan-European and Montreal processes

National, regional and international levels. European and Montreal Process countries widely use C&I as a framework for the periodic monitoring, reporting and assessment of forest trends and progress toward SFM at the national and international levels, including for the FRA. Some countries have stepped down or otherwise adapted process-level C&I to their national conditions. For example, the Canadian Council of Forest Ministers has developed national-level C&I based on the Montreal Process framework. Respondents from Austria, Norway, Slovenia and Sweden noted that national-level reporting encompasses the pan-European C&I but is more detailed and comprehensive. In other countries, such as Japan, New Zealand and the Russian Federation, where forest monitoring and assessment is based on existing laws and inventory systems, C&I are used primarily for broad-scale reporting as members of C&I processes.

Subnational level. Several respondents from Canada, Chile, China, Finland, Sweden, the United Kingdom and the United States indicated that they used C&I as a framework for forest monitoring and assessment at the subnational (e.g. state/provincial) and local levels, in some cases by stepping down or adapting national-level C&I to subnational scales. For example:

- In Canada, a number of provincial governments and institutions have developed provincial and local-level indicators drawn from the Montreal Process and Canadian C&I frameworks.
- In the United States, 16 states in the northeast have identified a subset of Montreal Process indicators for regional forest assessments. In the northwest, the state of Oregon has endorsed 19 indicators for achieving SFM. Other states and localities have also identified subsets of indicators applicable to their situations, although the approaches are not uniform or widespread.
- In Sweden, C&I are partly used for subnational forest MAR, complementing other means and sources of information.
- China has carried out national pilot studies aimed at promoting SFM and establishing C&I at various subnational levels.

FMU level. Although the pan-European and Montreal processes do not have FMU-level C&I, national-level data for many indicators, especially in decentralized government structures, is typically obtained by aggregating field/FMU-level data provided by states/provinces or other subnational forest authorities. Chile, Finland and the United Kingdom also noted that process or national C&I sets have provided a framework for MAR at the FMU level. In the province of Alberta, Canada, FMU-level reports by forest industry are based on approved forest management plans (FMPs) that include indicators that incorporate the Canadian C&I. Both China and the United States noted limited pilot applications of C&I at the FMU level.

Forest planning and programs – ITTO, ATO/ITTO and Tarapoto processes

The majority of respondents, including Colombia, Côte d'Ivoire, Guyana, Honduras, Malaysia (Sabah), Peru and Togo, reported using C&I as a framework for national forest-related planning and the development of national forest programs (NFPs) or comparable strategies. Several also reported using C&I in plans and programs at the subnational, local or field levels. For example:

- In Sabah, the ITTO C&I are applied as a basis of planning at the state, FMU and "compartment" levels, which have been identified for translating SFM policy into a set of coordinated actions.
- The Colombian Autonomous Regional Corporation[38] of Central Antioquia is developing an FMP within the framework of ITTO Project PD 438/06 Rev. 2(F) that will include C&I for the area covered by the project.
- Similarly, Colombia's Autonomous Regional Corporation of Valle del Cauca is developing a forest plan covering 36 river basins that takes into account the conceptual framework of the ITTO C&I.
- In Côte d'Ivoire, C&I are used in approving FMPs at the FMU level.

Forest planning and programs – pan-European and Montreal processes

Respondents from Austria, Canada, China, Finland, the Republic of Korea, Slovenia and the United States reported using C&I as a framework for forest-related planning, programs and strategies at various levels. For example:

- C&I parameters are integrated into the NFPs of Finland and Slovenia, as well as into their subnational forest programs and FMPs.
- In Austria, C&I contribute to planning at various levels and to the country's more comprehensive national inventory, which provides the main source of information for planning, particularly at local/FMU levels.
- China's State Forestry Administration used C&I as a basis of the 2008 Guidelines on National SFM and for forestry development plans at the national, provincial and county levels.
- In Canada, C&I have played an important role for more than two decades in developing national forest strategies. The provinces of Alberta, British Columbia and Ontario, and the Yukon Territory, have taken C&I into account in provincial/territorial forest strategies and in some cases in local/FMU-level management plans.
- In the United States, the strategic forest plan for the state of Oregon ("Forestry Program for Oregon") sets out seven goals related directly to the seven Montreal Process criteria. In Baltimore County, Maryland, the Montreal Process C&I framework, together with related national forest reports, has helped in the development of local programs to expand, protect and restore forests and to set urban forest canopy goals.

Developing regulations and guidelines – ITTO, ATO/ITTO and Tarapoto processes

Most tropical producer respondents indicated that C&I have provided a framework for regulating and developing guidelines for forest use and management practices at various levels and in various ways. For example:

- In Guyana, the ITTO C&I have provided guidance for developing and implementing forest policies and are taken into account in the Code of Practice for Timber Harvesting, which provides specific inventory, planning and harvesting requirements and guidelines for all forest concessions. The Guyana Forestry Commission has also used the ITTO C&I to structure key mechanisms for SFM.
- In Togo, the ATO/ITTO PC&I are a basis for the country's 2008 forest code.
- Côte d'Ivoire has used C&I to identify forestry rules for classified forests (*forêts classées*) zoned for production and protection and to some extent for forest concessions. Management plans prepared for classified forests follow the C&I framework for best management practices.
- Sabah, Malaysia, has applied the ITTO C&I in formulating "SFM license agreements", which

38 In Colombia, regional autonomous corporations are public agencies created by law, composed of local authorities and endowed with their own assets, legal personalities and administrative and financial autonomy. They are responsible for the implementation of laws, policies, master plans, programs and projects on the environment and renewable natural resources, in accordance with regulations and guidelines issued by the Ministry of Environment.

are used to regulate forest management within the state, as a basis for official audit and compliance reports and in developing guidelines for SFM auditing, reduced impact logging (RIL), forest restoration, planting, silvicultural practices, and the establishment of "permanent sample plots", as well as for conducting social baseline surveys.

- In Peru, C&I provide a legal framework for the management of all forests in the country.
- In Honduras, C&I are reflected in regulations covering all forests and are used to evaluate compliance with FMPs.
- In Brazil, some aspects of sets of C&I are covered in national regulations. The Brazilian Forest Service concession framework includes certain indicators to assure best practices in the field.
- Colombia's Ministry of Environment, Housing and Territorial Development has conducted partial evaluations on issues related to managing forest resource supplies and compliance with regulations and local community rights. Based on these evaluations, the government has promoted work with local communities in pilot areas and initiated a revision of the current regulatory framework for timber harvesting. The Autonomous Regional Corporation of Valle del Cauca also noted that once management planning is completed for the 36 watersheds mentioned above, detailed management guidelines at the FMU level will be prepared using the ITTO C&I.
- In Mexico, the Federal Attorney for Environmental Protection uses a set of C&I to assess compliance with logging permits at the FMU level and to determine whether a forest area can obtain SFM certification in accordance with a law enacted in 2008.
- In Ghana, the ITTO C&I and the ATO/ITTO PC&I were used in developing the Forestry Commission's forest management manuals and guidelines, providing a cornerstone of natural resource management.[39]

39 Based on information contained in ITTO (2011).

Developing regulations and guidelines – pan-European and Montreal processes

Responses indicate that C&I provide a framework for forest regulation and guidelines in some form in many European and Montreal Process countries. For example:

- The pan-European C&I are the reference for the UK Forestry Standard, which provides the framework for all forest management in the United Kingdom.
- In Norway, C&I provide a basis for forest legislation and standards developed for the regulation of forest management at the national, local and FMU levels.
- In Finland, C&I serve as a framework for developing and recommending specific improvements in forest management practices based on monitoring indicators.
- Quebec, Canada, has integrated national-level criteria into provincial laws governing the management of public and private forest lands.
- Slovenia has included C&I parameters in the national regulation of forest management planning, which applies to management plans developed for all forests.
- In Chile, C&I constitute a reference framework in the national law governing the "rehabilitation of native forests and forest development" aimed at the protection, rehabilitation and improvement of native forests.
- In the Republic of Korea, C&I are a basis for regulating forest practices for government-owned/managed forests. The Guideline for Sustainable Forest Resources has been developed covering all forests, including plantations.
- In China, C&I are a reference for the annual regulation of wood-harvesting quotas for all forests based on forest resource condition. In addition, based on the national pilot studies mentioned above, forest management schemes are compiled by FMUs based on C&I.

Some respondents noted that while C&I are not used directly for forest regulation, they have helped shape forest policy and management guidelines and in turn have influenced management practices. For example:

- In the United States, the National Association of State Foresters has used the C&I framework as a guide to assist private owners in developing FMPs. The state of Oregon has used C&I as a feedback loop to evaluate regulatory compliance and effectiveness.
- In Chile, C&I provide the framework for developing best management practices for experimental forests.
- C&I also provide the framework for developing best management practices for the Russian Federation's three model forests, which are part of the International Model Forest Network launched by Canada in 1992.
- Canada's Yukon Territory is in the early stages of developing a regulated forest management regime and is using C&I to obtain essential baseline information.

In a few countries, such as New Zealand, existing national or subnational laws and codes of best practice govern forest practice. Such regulations enshrine the principles and goals of SFM but are not based on and do not integrate C&I *per se*.

Developing standards/certification – ITTO, ATO/ITTO and Tarapoto processes

Several respondents, including from Côte d'Ivoire, Guyana, Honduras, Malaysia, Mexico and Peru, indicated that C&I have provided a basis for forest management certification schemes and other performance standards used in their countries, including national standards developed under the FSC or endorsed by the PEFC. For example:

- In Guyana, C&I are reflected in the legality assurance system, which checks forest operations and supply chains from harvesting to export and provides a reliable means for certifying that forest products are derived from legal sources.
- As noted above, Mexico has used FMU C&I at the FMU level in the development and implementation of, and compliance with, their national system of forest management and chain-of-custody (CoC) certification.
- The Peruvian Council for Voluntary Forest Certification has developed, based on the FSC P&C, certification standards for production forests in the Peruvian Amazon, which take into account the Tarapoto and ITTO C&I.
- Colombia has established a national NGO to promote voluntary forest certification under the FSC and develop standards for good forest management. The Autonomous Regional Corporation of Valle del Cauca has used the FSC P&C to certify private bamboo operations in Caicedonia.
- Sabah, Malaysia, has applied the ITTO C&I as a basis for developing a standard used in evaluating the performance of SFM license agreement holders in implementing SFM on the ground.
- In Gabon, the ATO/ITTO PC&I have been harmonized with the PEFC certification standards to create the Gabonese Forest Certification Scheme (PAFC Gabon) (Blaser et al. 2011).

In some cases, market-oriented certification appears to be overtaking the use of C&I at the FMU level. Guatemala, for example, noted that since national FSC standards were approved for the country, forest operators have been focusing on obtaining FSC certification. As of April 2012, twelve forest management certificates covering 500 000 ha and 13 CoC certificates had been issued under the FSC.

Developing standards/certification – pan-European and Montreal processes

Many pan-European and Montreal Process respondents indicated that governments are not involved in the certification of forest management practices, which is considered to be a voluntary, market-driven activity of the private sector. Several noted, however, that C&I have provided a framework for certification programs and schemes operating in their countries. For example, the Austrian PEFC standard is based on the pan-European C&I.

In addition, some governments have developed standards drawn from C&I to guide forest management. Already mentioned are the United Kingdom's forestry standard and Norway's performance standards at the national, local and FMU levels, which take into account the pan-European C&I. In addition:

- The Alberta [Canada] Forest Management Planning Standard is based on Canada's national C&I and sets out requirements for, among other things, watershed management, soil

conservation and species at risk in the province's government-owned timberlands.

- China has released national guidelines and standards for forest management and CoC certification, which are being gradually applied, for example in demonstration applications involving government-owned plantations.
- New Zealand is in the process of developing a national standard based on the FSC P&C and existing national laws and codes of best practice.

Innovative uses/applications of C&I

A number of respondents indicated the use of C&I as a tool for various purposes in addition to those mentioned above. Among ITTO producers, for example:

- Sabah, Malaysia, has applied the ITTO C&I as a basis for creating, in partnership with New Forests, the Malua Wildlife Habitat Conservation Bank (Malua BioBank) to generate sustainable financing for the conservation of unique forests in the Malua Forest Reserve (34 000 ha). Under this innovative program, commercial enterprises, NGOs and other entities can purchase biodiversity conservation certificates representing 100 m^2 of forest protection and rehabilitation. While there is no direct financial incentive for investors, commercial benefits accrue to companies in the form of brand imaging to consumers and the recognition of corporate social responsibility.
- Togo is using C&I for the preparation of environmental management plans in implementing projects that have impacts on forests.
- Peru is using C&I as guidance on the status of forests for watershed protection.
- Colombia has used C&I as a monitoring tool to verify logging permits granted in the municipality of Buenaventura.

In the temperate/boreal region, respondents from Canada (Natural Resources Canada, Quebec) and Finland reported using C&I to keep policymakers and the public informed about forests and forestry, identify forest-related research needs and priorities, and develop education initiatives. Canada also uses C&I as a framework for coordinating national and international forest information collection and management, and noted that C&I reporting has been helpful in demonstrating the country's commitment to SFM and in promoting Canadian forest products to environmentally sensitive international market places.

Stakeholder involvement – ITTO, ATO/ITTO and Tarapoto processes

Nearly all respondents indicated involving stakeholders in C&I-related activities. For example:

- Honduras indicated that all forest evaluations using C&I involve consultations with forest owners and users of national forests.
- Guyana has established a comprehensive and transparent consultation process that includes public and private organizations and individuals and involves stakeholders in all major policy and legislative decisions, including those related to C&I.
- Mexican authorities consulted with various stakeholders, including forest producer organizations, the private business sector, academia and state and local governments, in the process of formulating its 2008 national law governing certification.
- In Malaysia, multi-stakeholder consultations were conducted at the national and state levels in developing the forest management certification standards used in the Malaysia Timber Certification Scheme. In Sabah, those consultations involved government agencies, NGOs and community-based organizations.
- Côte d'Ivoire reported consultations involving local and riparian communities, NGOs and representatives of various private actors in the forest sector.

While most respondents considered the involvement of stakeholders a key factor in the successful application of C&I at the national, subnational and FMU levels, challenges were also noted in this regard. For example, Togo noted that a number of stakeholders had been resistant to the use of the ATO/ITTO PC&I, which were perceived as burdensome. With the support of the EU and FAO, the Togo government has established a national working group comprising public and private organizations and NGOs as part of its wider forest-sector reforms. Through this group, the country hopes to overcome stakeholder resistance

and to hasten the development and application of national C&I based on the ATO/ITTO PC&I, recognizing that it will take time for all actors to become open to the process.

Stakeholder involvement – pan-European and Montreal processes

Nearly all respondents indicated that stakeholders were actively involved in C&I-related activities, and several countries, including Finland, Slovenia, Sweden and the United States, emphasized that stakeholder participation is a basic principle of their wider forest management planning, assessment, reporting and regulatory processes. For example:

- The United States Forest Service chairs the Roundtable on Sustainable Forests, which comprises a wide range of federal, state, industry and environmental stakeholders. The state of Oregon involves stakeholders through public meetings, advisory committees, public comment solicitations and the Oregon Roundtable on Sustainable Forests. Baltimore County, Maryland, has a steering committee of citizens and county representatives which helps inform the county's forest program and participates as a partner in county projects.
- In Alberta, Canada, all new or updated performance standards are reviewed with stakeholders prior to approval and implementation. Ontario involves stakeholders in forest management planning and relevant legislative initiatives. In the Yukon Territory, Canada, forest resource management plans involve significant public consultation with First Nations, renewable resources councils, interest groups, industry and the public.
- Chile has established the Forest Users' Committee, comprising universities, research institutions and representatives of professional associations, NGOs and community groups, which has identified a set of "most representative" indicators for the swift implementation and monitoring of SFM.
- In Norway, forest management performance standards are developed by stakeholders.
- The State of Forests in Finland report, which is based on the pan-European C&I and the PEOLG, is prepared with stakeholder consultation.
- In the Russian Federation, stakeholders are involved in activities related to the management of model forests and in obtaining forest management certification.
- New Zealand's current initiative to develop an FSC-based national forest standard includes input from economic, social and environmental interests, as well as indigenous peoples.

Challenges encountered in using/applying C&I

All respondents reported encountering challenges in undertaking activities related to the effective use and application of C&I as a basis or framework for forest MAR, planning and regulation and the development of other policy instruments. Table 9

Table 9: Challenges encountered by forest authorities in using/applying C&I

Issue/constraint	No. of respondents citing issue/constraint		
	ITTO/ATO/Tarapoto	European/Montreal	Total
Lack of financial resources	13	12	25
Lack of technical resources	10	8	18
Limited stakeholder understanding of C&I and confusion with certification	9	9	18
Lack of political will	11	5	16
Conflict among stakeholders on forest use	9	7	16
Multiple forest ownership	7	4	11
Multiple layers/levels of forest authorities	3	6	9
Limited legal mandates re forests	3	4	7
Problems with land tenure	4	2	6
Unsuitable, impractical or outdated indicators	2	2	4
Lack of cross-sectoral coordination	1	2	3
Preference by forest operators for certification over C&I	1	1	2
Agricultural incursions into forests	1	-	1
Armed groups/conflict	1	-	1

summarizes these challenges and shows that there are both similarities and differences among tropical countries and temperate/boreal countries on the issues and constraints encountered.

ITTO, ATO/ITTO and Tarapoto processes

Lack of capacity. As shown in Table 10, among the top challenges cited by tropical respondents are limited financial and technical resources and related capacity issues, particularly in the collection of data on social and environmental indicators for which baseline information and inventory systems are limited or unavailable, as well as for enforcing laws and regulations. The specific nature of these issues varies across countries. For example:

- Guyana indicated that financial resources for forests/forestry compete with multiple agencies and a range of services.
- In Valle del Cauca, Colombia, the lack of financial resources is a problem given the large scale of investment required to finance programs and projects for preparing and implementing FMPs. A comprehensive financial strategy involving all social and institutional stakeholders related to forest-sector development is needed, but currently only the regional corporation is contributing financial resources.
- Mexico noted limited human resources with sufficient capacity and training for the use of C&I, and a lack of financial resources for the implementation of good forest management practices.
- In Sabah, Malaysia, some SFM license agreement holders are unable to generate adequate financial surpluses to reinvest into SFM, and the lack of adequate technical resources limits their ability to implement the concept of multiple-use forests according to SFM principles.
- In Togo, the lack of financial resources is a serious issue given that Togo has recently emerged from two decades of suspended international financial cooperation, which had previously provided significant private investment for forest-sector development.

Lack of political will. A lack of political will, which is closely related to a lack of financial and technical resources, was widely cited as a challenge to C&I uptake at the national, subnational and FMU levels. A lack of political will generally means that lower priority is given to achieving SFM relative to other development needs and goals and usually results in limited resource availability for forests, including for developing, implementing and enforcing policy instruments such as C&I.

Stakeholder issues. Many respondents highlighted difficulties in engaging stakeholders in C&I-related activities. In some cases, the problem was a limited understanding on the part of stakeholders of the concept and purpose of C&I or confusion between C&I and certification (Colombia, Côte d'Ivoire, Honduras, Peru and Togo). In other cases, issues arose due to conflicts among groups of stakeholders (e.g. forest owners, industry and local communities) about how forests and forest resources should be used and managed (Colombia, Honduras, Peru, Sabah and Togo). As previously mentioned, Togo noted resistance on the part of some stakeholders to the use of the ATO/ITTO PC&I, which were perceived as placing an additional burden on forest managers.

Other challenges. Other challenges to the effective use of C&I were more country-specific and included the following:

- problems associated with multiple forest ownership (Brazil, Colombia, Côte d'Ivoire, Mexico, Peru, Sabah and Togo);
- land-tenure issues (Colombia, Côte d'Ivoire and Peru);
- limitations in existing laws and a lack of incorporation of C&I into legal and policy instruments, including in terms of logging and post-logging monitoring (Colombia and Côte d'Ivoire);
- issues associated with multiple levels of government with forest responsibilities (Colombia);
- a lack of cross-sectoral coordination (Côte d'Ivoire);
- enforcement issues, such as the large-scale incursion by agricultural producers onto land classified as forest (Côte d'Ivoire) and the presence of armed groups (Colombia); and
- the greater attraction of market-oriented certification to owners/managers of production forests and limited value added that FMU C&I provide to certified companies (Guatemala).

Issues with C&I sets. Some respondents encountered challenges with the process-level sets of C&I, which have limited the application of C&I. Brazil noted that existing C&I do not adequately reflect the country's characteristics and circumstances. Similarly, Honduras pointed out that a number of indicators have little or no practical application in the Honduran context. Honduras also noted a lack of national-level indicators designed to measure the social and economic impacts of forestry activities, as well as a lack of indicators on profitability. Colombia and Peru noted that the ITTO C&I are too complex for easy use by indigenous peoples and local communities, which are increasingly forest managers. Guatemala cited certification as the biggest constraint to using FMU C&I, mentioning that C&I do not provide certified companies with value-added benefits.

Pan-European and Montreal processes

Major issues cited by temperate/boreal forest authorities were similar to those identified by tropical producers, with the notable exception of the lack of political will, which significantly fewer respondents identified as a problem.

Lack of capacity. A number of respondents noted limited financial and technical resources, particularly for collecting the data needed to effectively measure a number of indicators. While countries typically are able to generate or capture data for many indicators from existing forest inventory grids, research data and baseline economic and demographic information, some indicators require costly new or expanded inventory systems, for which resources were unavailable. To address these limitations, some respondents have focused on a core subset of indicators or relied on proxy indicators, such as case studies.

Stakeholder issues. Engaging stakeholders was a key issue for many European and Montreal Process countries (Austria, Canada, Chile, Finland, Korea, Norway, the United Kingdom and the United States). Limited stakeholder understanding of C&I included perceptions (e.g. among non-certified private operators) that C&I added costs and requirements and caused confusion among stakeholders about the differences between C&I and certification. Conflicts among stakeholders on how forests should be managed, including environmental campaigns against logging practices, are significant limiting factors in some countries.

Other challenges. The following challenges were more country-specific:

- jurisdictional issues related to multiple levels of government forest responsibilities (Canada, Chile and the United States);
- multiple forest ownership (Canada, Slovenia and the United States);
- the limitations of existing laws (the Russian Federation) and the lack of integration of C&I into government mandates and accountability (Canada and the United States);
- land-tenure issues (Canada and the United States);
- the lack of a mechanism for cross-sectoral coordination (Canada and China); and
- the greater attraction of certification to owners/managers of production forests (Japan).

Issues with C&I sets. As with ITTO producers, some countries noted issues with the process-level sets of C&I. For example, Finland considered that a number of indicators were overly complicated, irrelevant or outdated. Chile noted that some Montreal Process indicators were highly scientific in nature and could only be measured by countries with a high degree of technical sophistication. British Columbia (Canada) mentioned the unsuitability of some Canadian and Montreal Process C&I for FMU-level applications. Some respondents noted that C&I sets that had not been reviewed for some time should be reviewed and improved to take into account recent experiences in using C&I as well as global trends and developments related to forests and climate change, forest-based biofuels, forest certification and human health.

Impacts of C&I on SFM

An important aim of this study was to gain a better understanding of how and to what extent the above uses and applications of C&I have positively affected forest management in the field. In general, responding forest authorities had not undertaken formal assessments to determine the direct and indirect effects of C&I uptake on FMU operations. However, the government survey provided an opportunity for officials to provide expert views on the impacts of C&I on SFM over time based on the experiences of their organizations.

Table 10: Evaluations of the impact of C&I on SFM by respondents

Contribution of C&I to SFM	Countries (no. of respondents)	No. of responses	Forest area owned/ managed/regulated by respondents (1000 ha)
Great	Austria, Brazil, Finland, Guyana, Malaysia (Sabah), UK	6 (13%)	309 360
Moderate	Canada (5), Colombia (2), Côte d'Ivoire, Honduras, Japan, Mexico, Norway, Peru (3), Russian Federation, Slovenia, Togo (3), USA (1)	21 (46%)	514 936
Slight	Colombia (2), Chile, China (3), Korea (1), USA (3)	10 (22%)	129 221
None	Argentina, Guatemala, Republic of Korea (1), New Zealand (4), Sweden	8 (17%)	36 198
Did not know	Canada (1)	1 (2%)	28 235
Total		**46 (100%)**	**1 017 950**

Table 10 summarizes the views of respondents on the contributions of C&I to SFM.[40] It shows that evaluations of the impact of C&I vary from country to country and in some cases among officials within a country. However, the majority of forest authorities (59%) from both tropical countries (14 respondents) and temperate/boreal countries (13 respondents) considered that the introduction and uptake of C&I had led to "great" or "moderate" improvement in forest management practices in their countries, despite implementation challenges. This is significant because, combined, these agencies are responsible for nearly 825 million ha of forest worldwide – 20% of all forests – many of which are production forests.

Twenty-two percent of respondents, primarily in the temperate forest region, considered that C&I had had a positive impact on forest management, but only to a slight degree. Respondents from five countries considered that C&I had had no impact on SFM in their countries, and one respondent could not judge the impact of C&I uptake on SFM. These views are discussed in more detail below.

Great to moderate impacts on SFM

Respondents associated with the **ITTO, ATO/ ITTO and Tarapoto processes** who rated the impact of C&I on forest management practices as great to moderate specifically noted that C&I had catalyzed and provided a basis or framework for:

- improving forest inventory, MAR and procedures for forest management planning, implementation, monitoring and auditing;
- developing improved technical standards for forest management;
- guiding and enhancing SFM at the field/ operational level, improving FMPs and encouraging private operators to sustainably manage forest concessions;
- promoting private forest certification; and/or
- implementing log tracking systems, environmental monitoring assessment, and handling capabilities for geographic information systems (GIS).

Respondents associated with the **pan-European and Montreal processes** who rated the impact of C&I on SFM as great to moderate specifically mentioned that C&I had been instrumental in:

- increasing awareness, appreciation and understanding of broader forest resource issues, benefits and values beyond timber/fiber production, including biodiversity protection, soil and water conservation and community perspectives;
- improving forest inventory and monitoring systems and hence the data on which to base forest management policies, priorities and decisions;
- catalyzing changes in forest management policies and regulations based on changes in forests observed over time through the application of C&I;
- providing a framework for stakeholder consultation and dialogue and, in turn, improved decision-making;
- providing a tool for reaching a variety of forest-related goals and meeting forest-related mandates; and/or
- providing the basis of a common international understanding of SFM, which has contributed

40 Where a country had more than one respondent, column 2 of Table 10 indicates in parentheses the number of respondents from that country who shared the rating of the impact of C&I on SFM.

to improvements in forest legislation, administration and, in turn, management practices in countries.

Slight impacts on SFM

Several **ITTO, ATO/ITTO and Tarapoto C&I** respondents who rated the impact of C&I on forest management as slight acknowledged that C&I had been useful tools in a number of ways at the national and subnational levels but noted one or more of the following limitations:

- Existing sets of national and FMU C&I were good references and benchmarks for forest management, but each country needs to consider indicators in light of its own legal, political, socioeconomic and environmental context and characteristics.
- The absence of harmonized C&I at the national level for forest plantations and natural forests has prevented some countries from making better use of existing forest assets.
- The complexity of some sets of C&I has made them difficult to apply at the local levels, especially for indigenous peoples and local communities.
- The principles of C&I have been taken into consideration in promoting policies and practices for SFM, but countries faced resource, capacity and other challenges that have limited C&I implementation.

Respondents associated with the **pan-European and Montreal processes** who rated the impact of C&I on SFM as slight cited the following reasons militating against a greater impact:

- Forest management certification has become more attractive than C&I for many forest companies and other owners of timber-producing forests because they are recognized in the market place and include requirements for forest monitoring and assessment at the FMU level.
- C&I have helped organize, present and communicate existing data and ensure a rational and comprehensive compilation of existing information, but they have not become a framework for collecting and generating new data.
- Many of the positive forest-related policy initiatives and on-the-ground management changes that have taken place in recent decades would likely have also occurred in the absence of C&I.
- Policy reviews and changes are often driven by immediate issues and political priorities rather than by C&I reporting.
- C&I are successful only to the extent that they are aligned with what people more generally feel is important regarding forests.
- Countries face many challenges in expanding inventory systems to collect data on non-traditional social and environmental indicators, as well as stakeholder issues and other constraints.

No impact on SFM

The few respondents from the five processes who indicated that C&I had not led to improved forest management in their countries provided one or more of the following explanations:

- The country had a long-standing tradition of SFM that pre-dated the operationalization of C&I.
- Because forest owners/managers were increasingly interested in obtaining forest certification, C&I offered little value added to certified operators.
- Unique national circumstances limited the relevance of C&I (e.g. timber harvesting occurs only in plantations).

It is interesting to note that, overall, there was little difference between the views of tropical producers and temperate/boreal producers. Generalizing about the effectiveness of C&I in moving countries toward SFM is difficult given the highly individual nature of perceptions of C&I success. However, the following factors were noteworthy in many of the responses received: 1) the relevance of process-level C&I sets to national and FMU circumstances and conditions; 2) the extent of issues/constraints encountered and the capacity and political will to overcome such challenges; and 3) the extent to which forestry traditions, including laws and management requirements, already encompass SFM principles and are well-enforced.

Ex-post evaluations of ITTO-funded C&I projects

In 2010, ITTO commissioned ex-post evaluations of the following ITTO-funded C&I projects, which provide additional insights into country uses and applications of C&I, their impacts on SFM and the value of ITTO support, particularly for tropical Asia (ITTO 2010):

- PD 389/05 Rev.2 (F) – Application of the internal monitoring of SFM performance at FMU level (Indonesia)
- PD 225/03 Rev.1 (F) – Adoption and implementation of an appropriate system of C&I for the Philippines
- PD 195/03 Rev.2 (F) – To establish a national monitoring information for the effective conservation and sustainable management of Thailand's forest resources.

Indonesia

Indonesia proposed PD 389/05 Rev. 2 (F) to accelerate the implementation of SFM practices at the FMU level by improving the capacity of FMU managers to internally monitor forest conditions and operations using C&I and by developing government regulations to make monitoring a requirement for FMU managers. Through the project, the Government of Indonesia was able to:

- adapt the ITTO FMU C&I to the Indonesian context, which included developing specific indicators for mangrove forests, eliminating indicators considered too broad to be assessed by FMU managers (e.g. indicators related to climate), and reducing apparent redundancy among ITTO's indicators when examined across the seven ITTO criteria. The result was the identification of a core set of FMU indicators which formed the basis of "internal performance monitoring guidelines" suitable for monitoring FMU forestry practices;
- initiate development of a national-level and FMU-level forest database system to be built based on monitoring reports submitted by FMUs;
- design and test a training package for FMU managers and workers (over 200 trained) on how to apply the C&I-based monitoring guidelines, which included a component on the verification of the legality of timber sources;
- approve an independent auditor to assess FMU performance against the C&I-based guidelines and provide for the rewarding of well-performing FMU managers by granting them responsibility to self-assess the issuance of annual logging licenses; and
- convene a workshop of government officials, which made recommendations leading to the landmark Ministerial Decree 38/2009 consolidating "standards and guidelines on assessment of performance in sustainable production forest management and timber legality verification" covering all types of forests.

Philippines

The Philippines prepared PD 225/03 Rev. 1 (F) to help develop institutional mechanisms to assess progress toward SFM. Through the project, the Government of the Philippines was able to:

- identify, test and adopt sets of national- and FMU-level C&I based on the ITTO C&I but applicable to their own circumstances;
- initiate the development of GIS-compatible national and FMU forest databases using the country's C&I frameworks and complete an initial baseline report from which to assess future trends in forest conditions and progress toward SFM;
- develop a computer-based C&I audit system linked to the national and FMU C&I databases that can show yearly indicator trajectories to help independent auditors assess FMU performance; and
- make progress in mainstreaming C&I into the programs and projects of relevant forest authorities and in increasing awareness among government agencies and high-level officials of the importance of SFM and the role C&I can play in helping achieve it.

Thailand

Thailand prepared PD 195/03 Rev.2 (F) to help establish a national monitoring information system to provide regular data on wood and non-wood forest resources. Through the project, the Government of Thailand was able to:

- develop a template for C&I reports based on ITTO format guidelines;

- establish a national network of forest monitoring plots that can be used to prepare a GIS-compatible baseline report on forest conditions and resources and to monitor trends on the range of biophysical C&I; and
- collect initial baseline data and produce thematic maps and overlays indicating the locations of monitoring plots within the network.

While Thailand has banned timber harvesting from natural forests, the baseline data and monitoring network established under the ITTO project continue to be useful for assessing forest conditions and trends.

Contribution to SFM

The ex-post evaluation noted that the outputs of all three projects would have been facilitated and strengthened by the greater involvement of stakeholders in project planning and implementation. Nonetheless, the evaluators generally considered that the projects had, among other things, contributed significantly to the development and application of C&I within their respective countries, increased capacity to monitor forest trends and progress toward SFM at national and FMU levels, enhanced policy awareness of the benefits of C&I and SFM, and created momentum for countries to build on project outcomes.

5 ANALYSIS OF PRIVATE/NON-GOVERNMENT SURVEY RESPONSES

This chapter considers responses to the second ITTO C&I survey directed at private/independent forest stakeholders, including industry owners/managers, small forest owners, NGOs and others subject to a country's forest-related laws, policies and programs. Stakeholders are typically not members of C&I processes but, as noted in Chapter 4, their understanding of and involvement in C&I activities, and perspectives on the value of C&I, are often critical to the successful uptake of C&I within countries, particularly at the field level.

Overview

Forest stakeholders in ITTO and other producer countries represent a wide range of objectives and interests and take a variety of forms. For example, timber companies typically own or lease large forest areas for the purpose of wood production and revenue generation. Families and other small forest owners also engage in timber harvesting to generate income but do so on a non-industrial scale and often in conjunction with other forest uses, such as recreation. Forest-related associations represent the interests of their members (e.g. owners, producers, processors or exporters) and are typically non-profit organizations that do not directly own or manage forests. Certification programs set standards for forest management that owners/managers may choose to meet but, like associations, they are non-profit entities that do not directly manage forests or certify operations.

To avoid a proliferation of surveys for this wide range of stakeholders, a single survey was developed with questions tailored to key stakeholder groups (see Annex 7). Between March and December 2011, the ITTO Executive Director circulated the survey electronically to 250 individuals based on contact information obtained from ITTO and consultant databases or drawn from internet searches and personal contacts. (A list of recipients of this second survey is contained in Annex 8.)

Twenty-four responses (fewer than hoped for) were received from the following entities:

- eight tropical timber-harvesting companies managing (in total) 2 million ha of natural or plantation forests in Bolivia, Brazil, Cameroon, Ghana and Malaysia (Sarawak);
- four industry associations with 760 members representing (in total) more than 10.8 million ha of natural tropical forest in Bolivia, Brazil and Malaysia (Sarawak[41]);
- four companies managing 222 500 ha of tropical plantations in Australia, Bolivia, Ecuador and Mexico;
- one national NGO working with communities in Papua New Guinea (PNG);
- two family forest associations, including one international association whose members represent 25 million families owning an estimated 20–25% of the world's forests, primarily in Europe and North America; and
- five national/regional forest certification programs covering 94 million ha in Australia, Brazil, Cameroon, Malaysia[42] and North America.

Table 11 summarizes these respondents by country and region. Despite their small number, they represent a broad cross-section of forest stakeholders, as well as a significant forest area. As such, they provide a picture of C&I use by private and independent operators, particularly within the tropics, and may well reflect the experiences of industry and other stakeholders more widely across ITTO producer countries.

Companies and industry associations involved in harvesting in natural tropical forests

Forest areas and requirements for SFM

Respondents in this grouping comprised eight companies and four associations of companies with operations in natural tropical forests. Table 12 summarizes information for the responding companies, which together own or manage (in concessions) about 1.8 million ha of forest in

41 Information on the use of C&I by STA was provided informally by an STA senior manager and by the former chairman of ITTO's Trade Advisory Group, who was also General Manager of STA for many years.
42 Includes the Malaysian Timber Certification Council, which also responded to the government survey.

Table 11: Number of private/non-government respondents by country and region

Country/region	Company	Association	Certification	NGO	Total
Australia	1	-	1	-	2
Bolivia	3	1	-	-	4
Brazil	1	2	1	-	4
Cameroon	3	-	1	-	4
Denmark	-	1	-	-	1
Ghana	1	-	-	-	1
Ecuador	1	-	-	-	1
Malaysia	1	1	1	-	3
Mexico	1	-	-	-	1
PNG	-	-	-	1	1
North America	-	-	1	-	1
Temperate/boreal region	-	1	-	-	1
Total	**12**	**6**	**5**	**1**	**24**

Table 12: Overview of companies operating in natural tropical forests

Country/company	Forest area (1000 ha)			Certification	Laws require	
	Own	Lease	Co-manage		FMP	SFM/best management practices
Bolivia						
• La Chonta Woods Ltda	-	100	-	FSC	Yes	Yes
• Exotic Woods	1	-	-	FSC CoC in process	Yes	Yes
Brazil						
• Guavirá Industrial e Agroflorestal Ltda	60	-	-	-	Yes	Yes
Cameroon						
• PALLISCO–CIFM	-	341		FSC, OLB	Yes	Yes
• TRC Bois	-	140	77	FSC, OLB	Yes	Yes
• Wijma & Zonen BV	-	118	157	FSC, OLB	Yes	
Ghana						
• John Bitar & Co Ltd	-	54	-	FSC	Yes	Yes
Malaysia (Sarawak)						
• Jaya Tiasa Holdings Bhd	-	700	-	-	Yes	Yes
Total	**61**	**1 443**	**234**			

Bolivia, Brazil (Mato Grosso), Cameroon, Ghana and Malaysia (Sarawak). In Cameroon, this includes 157 000 ha that the Netherlands-based company Wijma & Zonen co-manages with either the Government of Cameroon (76 461 ha) or CAFECO (80 800 ha), another company operating in the country, as well as 76 891 ha managed by TRC (Transformation Reef Cameroun) Bois under partnership arrangements with two other companies awarded concession rights by the government.

Table 13 summarizes information on the responding forest industry associations, whose 760 member companies are engaged in timber harvesting, primary wood processing and/or secondary processing in Bolivia, Brazil and Sarawak, Malaysia. These companies own or manage more than 10.8 million ha of forest (not including members of the Association of Timber Industries Exporters – AIMEX – of Pará, Brazil, because that association did not have data on the area of forests owned or managed by its members).

Certification. As shown in tables 12 and 13, some harvesting operations are certified. La Chonta Woods and several members of the Forestry Chamber of Bolivia (*Camara Forestal de Bolivia* – CFB) in Bolivia, as well as the four companies operating in Cameroon and Ghana, are certified according to FSC national standards for both forest management and CoC. The companies operating in Cameroon are also certified under the government's system for the verification of timber origin and legality (*origine et legalite des bois* – OLB). Six

Table 13: Overview of industry associations with timber production/processing members

Country/ association	Members		Forest area (1000 ha)	Certification (1000 ha)	Laws require	
	Number	Type			FMP	SFM/BMP
Bolivia						
• CFB	120	Primary & secondary processing	3 200	1 200 (FSC)	-	-
Brazil						
• AIMEX	32	Primary & secondary processing	Not reported	6 members (area not reported)	Yes	Yes
• CIPEM	8	Timber industry unions	2 600 (estimate)	-	Yes	Yes
Malaysia						
• Sarawak Timber Association	600	Timber harvesting & primary/ secondary processing	5 000 (estimate)	-	Yes	Yes
Total	**760**		**10 800**			

members of AIMEX in Para, Brazil, are certified, but AIMEX did not have data on the forest area or the certification program involved. Exotic Woods in Bolivia is in the process of obtaining CoC certification under the FSC. The FMU operations of two members of the Sarawak Timber Association (STA) were certified under the early (2001) Malaysian Timber Certification Scheme (MTCS) using the 2001 Malaysian C&I (MC&I). This ended when the MTCS was upgraded in 2009 to achieve PEFC endorsement. One company is pursuing certification under the current system (MC&I Natural Forest).

Government requirements. Most respondents reported that the national and/or state laws and regulations under which they operate require that their harvesting operations are planned and carried out under approved FMPs, typically consistent with SFM and best management practices. Other requirements often apply as well. In addition to Cameroon's OLB system, Pallisco-CIFM noted that Cameroon's Offices of Audit and Administration conducted external audits of its operations and that internal audits were based on national legislation and environmental management plans as well as FSC national standards. The results of these assessments informed the direction for actions taken in the field. John Bitar & Co noted that, under Ghanaian law, logging operations may not violate the rights of workers and forest-fringe communities. AIMEX indicated government requirements related to land titles, rural environmental registration and licensing and geo-referenced maps of forest areas to be harvested, as well as specific legislation that includes C&I.

Awareness and use of C&I

Responding companies and industry associations varied in their knowledge of C&I. Table 14 shows that many respondents were aware of the ITTO C&I and, depending on the country, the ATO/ ITTO and Tarapoto processes. Among these respondents, all had been involved at some time in discussions or workshops with forest authorities on the purpose and use of C&I, and several had benefited from C&I training through ITTO and other entities. For example, Jaya Tiasa received training from the STA on using ITTO's FMU C&I. Guavirá Industrial received C&I training through local consultants knowledgeable in the field and through the Brazilian National Service of Industrial Learning, linked to the Federation of Industries of Mato Grosso, which has its own forest training area. AIMEX received training from the Tropical Forest Foundation (TFF) on RIL, which included C&I. Wijma & Zonen had not received training specifically on C&I but had received training and assistance on certification and SFM from the World Wildlife Fund, the *Office National des Forêts International* (a private research bureau), CIFOR and FORM International (a Dutch consulting firm).

Using FMU C&I for MAR. As shown in Table 15, the use of C&I to evaluate FMU operations varies and often depends on whether harvesting operations are certified. Generally, certified companies are using

Table 14: Familiarity of responding timber companies/industry associations with C&I

Country & company/ Association	Familiar with C&I process	Involved by authorities in C&I	Received C&I training (training provider)
Bolivia			
• La Chonta Woods Ltda	Tarapoto	Yes	Yes (ITTO)
• Exotic Woods	No	-	-
• CFB (120 members)	ITTO	Yes	Yes (ITTO)
Brazil			
• Guavirá Industrial e Agroflorestal Ltda	ITTO	Yes	Yes (government)
• AIMEX (32 members)	ITTO, Tarapoto	Yes	Yes (TFF)
• CIPEM (8 members)	No	-	-
Cameroon			
• Pallisco–CIFM	ITTO, ATO/ITTO	Yes	Yes (ITTO)
• TRC Bois	ITTO, ATO/ITTO	Yes	Yes (ITTO)
• Wijma & Zonen BV	ITTO, ATO/ITTO	Yes	-
Ghana			
• John Bitar & Co Ltd	ITTO, ATO/ITTO	Yes	Yes (ITTO)
Malaysia (Sarawak)			
• Jaya Tiasa Holdings Bhd	ITTO	Yes	Yes (STA)
• STA (600 members)	ITTO	Yes	-

Table 15: FMU C&I use and related training needs identified by responding timber companies/industry associations

Country & company/association	MAR scheme employed	C&I still useful?	C&I-related training needs
Bolivia			
• La Chonta Woods Ltda	FSC	-	None indicated
• Exotic Woods	-	-	None indicated
• CFB (120 members)	C&I	Yes	None indicated
Brazil			
• Guavirá Industrial e Agroflorestal Ltda	C&I	Yes	Use of C&I & RIL techniques
• AIMEX (32 members)	C&I	Yes	Use of C&I & RIL, leading to certification
• CIPEM (8 members)	-	-	Developing an evaluation system for SFM and capacity-building for CoC certification
Cameroon			
• Pallisco–CIFM	FSC	Yes	None indicated
• TRC Bois	FSC	-	None indicated
Wijma & Zonen BV	FSC	-	None indicated
Ghana			
• John Bitar & Co Ltd	FSC, C&I	Yes	Further use of C&I
Malaysia (Sarawak)			
• Jaya Tiasa Holdings Bhd	-	-	None indicated
• STA (600 members)	C&I	Yes	None indicated

FSC P&C for forest monitoring and assessment and for updating management plans. In some cases, the application of FMU C&I has helped pave the way to certification. In Africa, for example, the ATO/ITTO PC&I served as a baseline for some companies to move toward certification and are still considered a useful reference because they were developed through a multi-stakeholder process. John Bitar & Co, in particular, noted that FMU-level assessments using C&I contribute directly to improving forest management practices and, in turn, help clarify issues related to the environment and trade in forest products, including forest product certification. The company continues to use the ATO/ITTO PC&I in preparing reports on the protective and environmental functions of forest resources and assessing high-conservation-value forests in all their concessions and timber utilization contracts.

In Sarawak, Malaysia, STA has used C&I as the basis for designing in-service training for forest managers of member companies, including Jaya Tiasa Holdings, on the concept and implementation of SFM. STA has also worked with Lincoln University in New Zealand to incorporate STA's C&I-based training curriculum into the university's post-graduate forestry diploma program (in the first year of a two-year master's degree) and has since put two groups of forest managers through the diploma program.

In Brazil, AIMEX reported that it uses C&I to assess and monitor forest management by quantifying verifiers classified by a forest evaluation unit in order to comply with IBAMA's implementing regulations of 2006. Both Guavirá Industrial and CFB (the latter in Bolivia) are using FMU C&I to monitor, assess and report on the state of management in their forest areas. CFB also uses C&I guidelines in preparing quarterly reports and annual reports on its forest operating plans.

C&I related training needs. Generally, certified companies and associations with a majority of certified members did not express interest in receiving training or assistance related to C&I. One exception was John Bitar & Co, which would welcome further training in applying C&I to increase the knowledge base of its field workers. The respondents from Brazil were also interested in receiving C&I-related training, with a view to moving toward certification. AIMEX noted that many of its non-certified members were interested in training workers on RIL techniques and related C&I applications, which may lead to a process of certification. Guavirá Industrial was also interested in receiving training on C&I and new techniques for low-impact forest management and logging, as well as information on innovations that would allow greater control and knowledge of forest growth and sustainable cutting cycles. The Center for Wood Producers and Exporters of Mato Grosso (CIPEM) indicated a need for assistance to develop an evaluation system for SFM, based, for example, on C&I and to build capacity to obtain CoC certification.

In general, the responses of the forest industry tend to reinforce those of forest officials regarding the importance of government outreach and communication with stakeholders, as well as training, in the uptake of C&I at the FMU level. The responses also indicate that: 1) large-scale harvesting operations are now widely required to be carried out and reviewed under approved FMPs consistent with SFM; 2) companies with certified operations may find less value added in applying FMU C&I; and 3) there appears significant scope in some countries for non-certified companies to benefit from C&I-related training in order to better evaluate and improve management practices and, in some cases, as an initial step toward certification.

Plantation companies

Table 16 summarizes information for the four plantation companies responding to the survey, which together own or lease about 222 500 ha of tropical plantations in Australia, Bolivia, Ecuador and Mexico. The companies are certified or in the process of becoming certified and three reported that national and/or state laws and regulations

Table 16: Summary of responses from plantation companies

Country/ company	Forest area (1000 ha)		Certification	Laws require		Familiar with C&I	Use C&I
	Own	Lease		FMP	SFM/ best management practices		
Australia • Forestry Plantations Queensland	-	204	AFS/PEFC, FSC in process	Yes	Yes	No	No
Bolivia • Agroindustrial El Cedro	0.015	-	FSC in process	-	-	ITTO	No
Ecuador • Aglomerados Cotopaxi	12.5	-	FSC in process	Yes	-	ITTO	No
Mexico • Proteak Renewable Forestry	6.0	-	FSC	Yes	Yes	No	No
Total	**18.5**	**204**					

require harvesting operations to be planned and carried out under approved FMPs. Other requirements may apply as well. For example, Proteak noted that the Mexican National Forest Commission (CONAFOR) reviews the use of funds the company receives through government subsidies.

Awareness and use of C&I. El Cedro in Bolivia and Cotopaxi in Ecuador were familiar with the ITTO C&I. Cotopaxi was aware of ITTO-funded training on C&I implementation carried out by the Juan Manuel Durini Forest Foundation but used its own procedures, rather than C&I, for forest inventory, assessment and follow-up. El Cedro had been involved in C&I discussions with Bolivian forest authorities with respect to developing national FSC standards. El Cedro was a member of the board of the National Council for Voluntary Certification and was pursuing FSC certification. El Cedro considered that the use of ITTO's C&I as an alternative or in addition to forest certification could contribute significantly to SFM in both natural forests and forest plantations. However, the C&I must be easy to understand and simple to apply if forest operators are to adopt them as a management tool.

While four is a small sample size from which to draw conclusions, these responses suggest that, in many cases, tropical plantation operations: 1) are subject to government requirements for management plans comparable with those required for natural forest operations; 2) are less familiar generally with FMU C&I than companies operating in natural forests; and 3) are pursuing certification and therefore are less likely to have an interest in FMU C&I applications.

Community and family forestry

Three survey responses were received from community and family forestry organizations. As shown in Table 17, these were the Foundation for People and Community Development (FPCD) in PNG, the International Family Forestry Alliance (IFFA) based in Washington, DC, and the Danish Forest Association. Despite their small number, these organizations represent an interesting spectrum of small-scale forest operations, as well as a significant forest area, and provide insight into the relevance of C&I to these stakeholders.

Community forestry in PNG

FPCD is a national NGO that co-manages nearly 7000 ha of forests with indigenous forest land and resource owners in PNG. The organization works directly with local communities and clan members to help them establish small-scale forestry operations based on managing their forests and timber resources sustainably.

Certification versus FMU C&I. FPCD is a long-time observer at ITTO meetings and is familiar with ITTO's extensive work on national- and FMU-level C&I, as well as ITTO's activities more broadly. However, FPCD's forest management assessment framework follows the FSC approach, which is simple to use, market-oriented and relevant to the PNG context. Based on FSC national standards approved for PNG in 2009, FPCD has developed the Indigenous Community Forestry Group Certification Scheme (ICF), which is designed to demonstrate and promote SFM and improved markets under the FSC label, and to bring access to FSC certification to PNG's forest resources owners. When clans agree to comply with the ICF in managing their forests, they are basically complying with the ten FSC P&C. Thus far, five clans have committed to the ICF, which is in the process of being accredited under the country's national FSC system.

Family forestry in the temperate/boreal region

The IFFA is a global network of 21 national forest-owner organizations (including the Danish Forest Association) that collectively represent the interests

Table 17: Overview of responding community/family forest organizations

Organization	Members		Forest region	Forest area (1000 ha)	Certification
	No.	Type			
FPCD (PNG)	Not applicable	Local communities	tropical	7	FSC-based
IFFA	21	National forest-owner organizations	temperate/boreal	800 000 (estimated)	PEFC/FSC partial
Danish Forest Association (IFFA member)	500	Family & small forest owners	temperate	142	PEFC/FSC partial

of some 25 million families owning an estimated 20–25% of the world's forests and woodlands, primarily in Europe but also in Australia, Canada, Kenya and the United States. The Confederation of European Forest Owners and the PEFC are among the associate members of the IFFA, and the IFFA is an international stakeholder member of the PEFC. Although the IFFA focuses on the temperate and boreal forest regions, where 40% of forests are owned and managed by families, it also cooperates with the Global Alliance of Community Forestry (GAFC)[43] and the Panama-based International Alliance of Indigenous and Tribal Peoples of the Tropical Forests through the Three Rights Holders Group, which aims to promote locally controlled forestry and SFM.

In a number of IFFA countries, including Denmark, Finland, Norway, Sweden and the United States, 50–80% of forest lands are owned by families, many of whom are also small farmers. Family forests and woodlands are often managed for multiple uses, including recreation and non-wood products (e.g. berries), as well as timber production.

Certification. The area of certified family forestry operations varies from country to country. In some IFFA countries, such as Finland, all or most family operations are certified under the PEFC and/or the FSC. Denmark reports that about 45% of its forests (240 000 ha) are PEFC-certified, often under group certificates that help reduce certification costs for families managing small areas of forest and woodland. In other IFFA countries, the percentage of certified family forests is relatively small. A number of IFFA organizations, including the Denmark Forest Association, have been involved in the development of national certification systems endorsed by the PEFC.

Government requirements. Small-scale forest and woodlot owners represented by IFFA members are typically subject to government regulations that require harvesting to be planned and carried out under approved FMPs. The specific nature of the requirements varies across countries. In many countries, especially in Europe, NFPs are important frameworks for family forestry operations.

Awareness and use of C&I. The IFFA and many of its member organizations, including the Danish Forest Association, are familiar with C&I, in particular those of the pan-European and Montreal processes, and have been involved in C&I discussions with forest authorities. As previously noted, while these two processes have not developed FMU C&I, some participating governments have integrated process-level C&I into NFPs and other forest strategies and guidelines that govern FMU management practices by families and other forest owners. Although many individual family owners may not be conversant with C&I *per se,* their management practices are consistent with C&I principles.

Some forest-owner associations have assisted families to meet C&I-related requirements by providing practical information, handbooks and extension services. The IFFA uses C&I, together with local and traditional knowledge, as guides in promoting SFM and locally controlled forestry. The IFFA is also working on the use of C&I to monitor and assess forest management practices with a number of partner organizations and initiatives, such as the Growing Forest Partnerships initiative.[44]

National/regional certification programs

Survey responses were received from five certification programs operating in Australia, Brazil, Cameroon, Malaysia and Canada and the United States. Table 18 shows that nearly 94 million ha have been certified under these programs. SFI, based in Washington, DC, is the third-largest certification program after the PEFC and the FSC.

The five programs shown in Table 18 are all independent entities that set standards for forest management certification and CoC certification, usually in consultation with a wide range of stakeholders. The programs do not themselves certify forest management practices, although those in Brazil, Cameroon and Malaysia are associated with independent accreditation bodies. Typically, a forest owner/manager pays an accredited private certification body or company to evaluate their

43 The GAFC's eleven national and regional member organizations manage about 9 million ha of primarily tropical forests and represent 12 million people, most of whom depend directly on community forestry for subsistence and livelihoods.

44 Launched in July 2008 as a joint initiative of the World Bank, FAO, IUCN and the International Institute for Environment and Development, the Global Forest Partnership facilitates local and international forest partnerships and investment in locally controlled forests. Involved countries are Ghana, Guatemala, Liberia, Mozambique and Nepal. An independent evaluation of the initiative through to June 2012 is planned.

Table 18: Overview of responding national/regional certification programs

Certification program	C&I reference framework	Forest area certified (1000 ha)	Associated with:
AFS	-	10 273	PEFC
CERFLOR	ITTO, Tarapoto	1 335	PEFC
Cameroon Forest Certification Initiative	ATO/ITTO	938	FSC
MTCS	ITTO	4 649	PEFC
SFI	Montreal Process	Canada 53 193 USA 23 493	PEFC
	Total	**93 881**	

forest practices and determine if they meet the standards of a given certification program.

Relationship to C&I. Respondents from four programs noted that their forest management standards are, or have been, closely aligned with various sets of C&I, as follows:

- **Brazil.** CERFLOR's forest management standards, which were developed by the Brazilian Association for Standardization, a private, non-profit organization, are based on the ITTO and Tarapoto C&I, as well as on forest management criteria defined in Brazilian law.
- **Cameroon.** The Cameroon Forest Certification Initiative is based primarily on the FSC P&C. However, the ATO/ITTO C&I provided a basis for developing standards for community forestry certification and continue to be used as training tools to audit forest practices in forest concessions, as well as education tools in university programs.
- **Malaysia.** The initial MTCS standard, known as the Malaysian Criteria, Indicators, Activities and Standards of Performance for Forest Management Certification, was based on a subset of the 1998 ITTO C&I identified through broad-based consultations among stakeholders in Sabah, Sarawak and Peninsular Malaysia. The MC&I scheme was upgraded in 2009 when it achieved PEFC endorsement and is now known as MC&I Natural Forest. The current scheme continues to be administered by the Malaysian Timber Certification Council.
- **Canada and the United States.** The SFI standards are based on the Montreal Process C&I. Periodic reviews of the standards take into account improvements in the Montreal Process C&I. The SFI's 2010–2014 standard includes new language to address the emerging issues of climate change and bioenergy feedstock harvesting.

These responses reinforce the close relationship between the ITTO, ATO/ITTO, Tarapoto and/or Montreal sets of C&I and national certification standards. The PEFC, which uses benchmark standards that build on the pan-European, ITTO and ATO/ITTO C&I frameworks, has endorsed four of the responding national programs (the Australian Forestry Standard – AFS, CERFLOR, the MTCS and SFI).

6 TRENDS AND EMERGING ISSUES RELATED TO C&I

Trends related to FMU management

Increased area of forest under sustainable management

According to FAO (2010a), the area of forest covered by FMPs – important tools for achieving SFM – increased steadily in the decade to 2010 and now exceeds 1.6 billion ha globally. This suggests an overall positive trend toward SFM, recognizing that not all FMPs are implemented effectively and that a forest may be sustainably managed without an FMP. Based on additional information on the "area of forest under SFM" collected from over 100 countries representing 62% of forests, FAO (2010a) concluded that "significant progress has been made over the last ten years" toward SFM.[45] This is borne out by responses to the government C&I survey, in which 80% of respondents indicated that C&I have contributed to improvements over time in forest management in their countries.

Blaser et al. (2011) confirmed these trends for the tropics, estimating that the area under SFM in ITTO producer countries increased by 50% between 2005 and 2010, to 53 million ha. An estimated 131 million ha of production-focused natural tropical forests were under management plans, compared with 96 million ha in 2005. ITTO training and project support in the last several years has contributed to these positive developments.

A major driver of improved FMU management globally has been growing demand in markets for certified wood and wood products. Based on government responses to the survey reported in this study (see Chapter 4), another important factor has been improved forest policies, programs and regulations that integrate or use C&I, as well as the better enforcement of forest-related laws. According to Blaser et al. (2011), a further driver of SFM in tropical forests has been emerging climate initiatives.

45 For FRA 2010 (FAO 2010a), countries were asked to provide information on the "area of forest under sustainable management" using national definitions, criteria and assessment methods, including expert estimates. Due to the country-specific nature of the 100+ responses, FRA 2010 does not aggregate national SFM data to provide statistics (e.g. percentages, hectares) at the global scale.

Trends in forest certification and legal verification – FMU certification

As noted above, the increase in SFM has been driven in part by growing demands in key markets for assurances that wood and wood products are sourced legally and sustainably. Forest owners and managers, from families to large-scale operators, have increasingly sought to tap into these markets. The area of certified FMU operations worldwide expanded 300% in the eight years from 2004 to 2012, from about 95 million ha to about 394 million ha, nearly 10% of the world's forests and 20% of timber-producing forests.[46] Most of these forests[47] are certified under national schemes endorsed by the PEFC or under national FSC standards and, as shown in Tables 19 and 20, are located in Europe and North America.[48] Five countries – Canada, the United States, the Russian Federation, Finland and Sweden – account for about 73% of PEFC-certified forest and 70% of FSC-certified forest.

Certified FMU operations in ITTO producer countries are also expanding, although more modestly. This trend is indicated in a number of C&I survey responses, as discussed in Chapter 5. As shown in Table 21, about 16.4 million ha of tropical FMU operations were certified under the FSC in 2012: 9.4 million ha in Latin America, 5.2 million ha in Africa and 1.8 million in the Asia–Pacific region. Another 5.9 million ha were certified under PEFC-endorsed national programs in Malaysia (4.6 million ha) and Brazil (1.3 million ha). From 2007 to 2010, the PEFC also endorsed PAFC Gabon, which is based on the ATO/ITTO PC&I. Revisions to PAFC Gabon are expected to lead to renewed PEFC endorsement.

46 According to FAO (2010a), 30% of forests are designated for production and another 24% for multiple use, often including production. Assuming roughly 50% (2 billion ha) of forests are used for production, and most certified forests are timberlands, it is estimated that about 20% of production forests are certified.

47 Mainly natural and semi-natural forests but also some planted/plantation and mixed forests.

48 In Chapter 6, all figures for the PEFC are from March 2012 and all figures for the FSC are from April–May 2012. While there may be some overlap in PEFC and FSC certificates where forest owners/managers have both types of certification, this is not widely the case.

Table 19: Certified forest area under PEFC and FSC, by region, 2012

Region	PEFC (m ha)	Countries	FSC (m ha)	Countries
Africa	-	-	7.3	12
Asia–Pacific	14.7	2	7.8	16
Europe	79.6	21	66.5	32
Latin America/Caribbean	3.2	2	11.3	17
North America	145.8	2	57.8	3
Total	**243.3**	**27**	**150.7**	**80**

Table 20: Countries with largest areas of FSC- or PEFC-certified forests, 2012

Country	PEFC (m ha)	Country	FSC (m ha)
Canada	110.1	Canada	43.4
USA	35.6	Russian Federation	29.9
Finland	21.1	USA	14.1
Sweden	11.0	Sweden	11.6
Australia	10.1	Poland	7.0
Norway	9.1	Brazil	6.5
Belarus	8.5	Belarus	3.2
Germany	7.4	China	2.7
France	5.0	Congo	2.5
Malaysia	4.6	Croatia	2.0

Table 21: Forest area certified under FSC in tropical countries, 2012

Country	FSC-certified forest (1000ha)	Country	FSC-certified forest (1000ha)
Africa		**Latin America**	
Congo	2 500	Brazil	6 500
Gabon	1 900	Bolivia	1 100
Cameroon	821	Peru	746
Ghana	2	Guatemala	500
Total	**5 223**	Honduras	153
Asia–Pacific		Venezuela	140
Indonesia	985	Colombia	106
Malaysia	602	Suriname	89
Solomon Islands	64	Ecuador	38
Viet Nam	41	Panama	9
PNG	33	**Total**	**9 381**
Thailand	23		
India	20		
Total	**1 768**		

Additional forest areas have been certified under national schemes that have become operational in the last decade. These include Mexico's national system of SFM and CoC certification and Peru's Council for Voluntary Certification, as well as Japan's Sustainable Green Ecosystem Council (which, as of January 2012, had issued 116 certificates covering 864 351 ha of forest, including some forests owned by major companies such as Oji Paper and Nippon Paper).

The trend toward forest certification is likely to continue as producers seek access to environmentally sensitive domestic and foreign markets (recognizing that many markets will remain open to uncertified products). Although growth in certification is likely to be slower in the tropics due to capacity and governance issues and the costs associated with certification, increases in certified forest areas and products are still expected, with possible implications for FMU C&I. Based on survey responses reviewed in Chapter 5, the value added of FMU C&I is generally lower for certified tropical operators given the FMU monitoring and evaluation requirements that accompany certification.

Trends in forest certification and legal verification – CoC and legal verification

In the last decade, consumer concerns about illegal logging and the trade in illegally harvested timber have stimulated various initiatives to guarantee that wood and wood-based products are sourced legally in the country of origin and can be traced back through CoC to sustainably managed forests.

PEFC and FSC. Between 2001 and 2005, the FSC and the PEFC introduced CoC certification for processed products (e.g. building products, paper and packaging), which involved certifying all entities along a supply chain before a product could be labelled as legally and sustainably sourced. CoC certification has since expanded rapidly and, as shown in Table 22, currently amounts to over 30 000 certificates. While most of these certificates are for products produced in temperate or boreal forests (i.e. in Europe and North America), tropical forest products are increasingly represented, particularly products originating in Brazil (909 certificates), Malaysia (305 certificates), Viet Nam

Table 22: Chain-of-custody certificates issued under the FSC and the PEFC, by region, 2012

Region	No. of PEFC certificates	No. of countries	No. of FSC certificates	No. of countries
Africa	6	4	133	14
Asia/Pacific	784	17	4 957	29
Europe	7 047	21	11 631	39
Latin America/Caribbean	86	6	945	17
North America	547	3	4 724	3
Total	**8 470**	**51**	**22 390**	**102**

(270 certificates), India (217 certificates) and Indonesia (183 certificates), and lesser numbers of CoC certificates have also been issued in Mexico, Bolivia, Colombia, the Republic of the Congo, Côte d'Ivoire, Cameroon, Ecuador, Gabon, Ghana, Philippines and Thailand.

Tropical Forest Foundation. The TFF introduced its Forest-Market Linking Program in 2006, which provides standards for both legal verification/CoC and RIL in a two-step process. The first step is TFF's "Legal Verified with CoC" certification, which is granted when a company meets widely accepted principles of marketing, documentation and administration, including third-party verification, and all parties in the supply chain have systems in place to identify and document the flow of logs and derived products from the forest to the finished product. The TFF Legal Verified CoC mark asserts that the timber supplier has performed due diligence and the product is legally sourced. The timber supplier must also commit to training in RIL within two years of receiving the certification.

The second step is the TFF "RIL Verified" program, which goes beyond legal sourcing to require that FMUs meet a set of standards associated with effective RIL and demonstrate substantial commitment to SFM. The TFF assists in linking tropical supplier companies certified under its CoC and RIL standards with buyers worldwide and offers onsite training to help forest operators and manufacturers achieve certification. Since the TFF certification scheme became operational, five plywood product suppliers in Indonesia have achieved Legal Verified CoC and three suppliers have received the RIL Verified mark. Some of these operators have been successful in pursuing "higher-level" certification under the FSC or the PEFC based on the TFF marks.

EU voluntary partnership agreements. In 2005, as a follow up to the forest law enforcement and governance regional processes launched in response to the 1998 G8 Action Program on Forests, the EU adopted its Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan. The plan includes a voluntary licensing scheme to verify that timber and timber products imported into the EU were legally harvested in the country of origin.[49] The scheme is being implemented through bilateral voluntary partnership agreements (VPAs) negotiated with timber-exporting countries, with inputs from the private sector and civil society. The VPAs set forth licensing procedures and measures for determining legality along the supply chain and include commitments for, among other things, improving forest-related governance and law enforcement. Only licensed products from VPA partners are allowed access to the EU. To date, the EU has signed VPAs with Ghana (2009), Cameroon (2010) and the Republic of the Congo (2010), and it has concluded negotiations with the Central African Republic and Indonesia. Discussions are in progress with the Democratic Republic of Congo, Gabon, Malaysia and Viet Nam.

EU Timber Regulation. In December 2010, the EU took the FLEGT Action Plan a step further by enacting the EU Timber Regulation, under which the importation and sale of illegally harvested timber and timber products in the EU market place will be banned as of March 2013. Subsequently, evidence of legality (e.g. a PEFC or FSC certificate or a VPA license) will be required for all wood and wood products.

US Lacey Act. In 2008, the United States significantly amended the Lacey Act of 1900, which combats trafficking in illegal wildlife, fish

49 The implementation of the FLEGT Action Plan is supported by the FLEGT Facility, established in 2007 and hosted and managed by the European Forest Institute headquartered in Joensuu, Finland.

and plants, to encompass a broader range of plants and plant products, including timber and timber products, and to address illegal logging and other illegal plant trade. The Lacey Act now prohibits the importation into the United States of lumber, furniture and other wood products originating from illegally harvested timber in the country of origin; requires importers to declare the country of harvest origin and the species names of plants contained in their products; and establishes penalties for violations. The implementation of the revised Lacey Act is being phased in. In June 2011, the United States Department of Agriculture solicited public comments on potential declaration requirements, including products to be covered; possible exceptions (e.g. for products with minimal plant material content); and the consolidated naming of genus/species groups commonly used in commercial production (e.g. along the lines of the SPF acronym currently recognized for "spruce, pine and fir"). The United States Department of Agriculture is also working on a definition of "common cultivar".

Government and private procurement policies. In 2005, G8 ministers agreed to "encourage, adopt or extend public timber procurement policies that favor legal timber" (Derby, England, March 2005). In follow-up, some G8 members, including Japan and the United Kingdom, introduced policies limiting government procurement to legally harvested wood products. The United Kingdom procurement policy specifically requires all central government departments to purchase only timber and timber products shown to derive from sustainably and legally managed forests or licensed under a VPA. Similar policies are being considered for subnational and local levels of government and publicly funded organizations. Private procurement is also on the rise. For example, the SFI offers certification for the responsible procurement of wood and paper products sourced in North America or sold in North America but sourced in other countries. The SFI procurement standard requires that organizations buying raw materials have an auditable procurement process designed to improve forest management on all suppliers' lands.

National tracking systems. Tropical producer countries have also taken steps to establish and implement log-tracking systems, such as Guyana's legality assurance system, Mexico's national system of SFM and CoC certification, and Cameroon's OLB (see chapters 4 and 5). ITTO has funded log-tracking activities in nearly half its producer member countries, including through the Thematic Programme on Forest Law Enforcement, Governance and Trade. ITTO is also working with Germany on a DNA tracking project in Africa. In view of the expanding range of tracking options available to producers, ITTO convened an international workshop on tracking technologies for forest governance in Malaysia in May 2012.

Increased local control of tropical forests

An estimated 1 billion ha of forests are privately owned, the majority by some 25 million families primarily in Europe and North America. As noted by Blaser et al. (2011), the local control of forests has also expanded significantly in the tropics in recent years. Since 2002, an estimated 30 million ha of tropical forest have been turned over to local and indigenous communities, particularly in Latin America and to a lesser extent in Asia. Today, 25% of tropical forests are under some form of local control, and this is expected to increase to 30% by 2015.

Local and indigenous communities are therefore increasingly important stakeholders and factors in achieving SFM in tropical forests, including production forests. ITTO has recognized this, most recently in its Thematic Programme on Community Forest Management and Enterprises, as have a number of other international and regional organizations and initiatives.

The transition from centralized to local forest control has not been without challenges. In addition to administrative issues and the limited capacity of some communities, many of the forests being transferred are degraded and warrant special management approaches. As suggested by some respondents to the government C&I survey, a simplified set of FMU C&I adapted to community circumstances could be helpful in establishing forest baseline information, management objectives and a practical forest assessment and monitoring framework. Community-oriented FMU C&I could also advance efforts by the Three Rights Holders Group, which is working with the PEFC to promote group certification as a cost-sharing tool to promote the sustainable management of locally controlled forests.

Relevant developments and emerging issues

SFM is increasingly recognized as integral to a wide array of sustainable development issues at various levels. In May 2009, in its resolution on "Forests in a changing environment", the eighth session of the UNFF (UNFF 8) emphasized that "sustainable forest management ... aims to maintain and enhance the economic, social and environmental benefits of all types of forests and as such can significantly contribute to addressing climate change, desertification, forest and land degradation, forest biodiversity and soil and water conservation".[50]

UNFF 8 invited the governing bodies of CPF member organizations, in particular the conferences of the parties (COPs) to the UN Framework Convention on Climate Change (UNFCCC), the CBD and the UN Convention to Combat Desertification (UNCCD), to integrate SFM into their strategies by, among other things, "building on existing and well-established forest-related tools, processes, programs and activities available at the national, regional and international levels to implement SFM, for example … criteria and indicators for sustainable forest management ...".

This message was underscored in the outcomes of recent C&I collaborative meetings (discussed in Chapter 3), including the recommendations of the International Seminar on Challenges of Sustainable Forest Management (Tokyo, Japan, March 2011) and the Joint Statement of the Montreal Process, ITTO, FOREST EUROPE and FAO (Victoria, Canada, October 2011). The value and contributions of C&I for SFM in addressing global challenges and opportunities are increasingly evident, as discussed below.

REDD+ and forest carbon accounting

The initiative to reduce emissions from deforestation and forest degradation in developing countries (REDD) aims to create a financial value for the carbon stored in forests and offer incentives for developing countries to reduce emissions from deforestation and forest degradation (which account for an estimated 20% of annual carbon emissions) and invest in low-carbon pathways to sustainable development. Concerns that REDD may view and value forests solely or primarily for their carbon storage benefits ("trees as carbon sticks") have led to REDD+, which goes beyond REDD to include the role of forest conservation, "sustainable management of forests" and the enhancement of forest carbon stocks.

Most of the national and FMU sets of C&I identify a number of quantifiable indicators, under various criteria headings, that are relevant to forest carbon accounting. These include indicators on forest area and type, growing stock, age structure, annual removals, annual harvest, and amount of carbon stored in forest stands. Criterion 5 of the Montreal Process (forest contribution to global carbon cycles) also includes indicators on the total forest ecosystem carbon pools and fluxes, total forest product carbon pools and fluxes, and avoided fossil-fuel carbon emissions by using forest biomass for energy.

Responses to the government C&I survey show how a number of countries are drawing on such C&I indicators and data sets in the context of forest carbon. For example:

- Guyana is using C&I to help guide its approach to the REDD+ objective of "sustainable management of forests".
- In Sabah, Malaysia, C&I are taken into account in carbon stock baseline assessments in various types of forests.
- In Canada, C&I are closely linked with forest carbon accounting methodologies and calculations at the national level.
- Similarly in Finland, the Russian Federation and Slovenia, C&I and related national forest inventories are considered in carbon calculations. Finland noted its relevant work on forest inventories with Kenya, Nepal and Viet Nam.
- Since 2009, China has been developing nationwide carbon accounting models for major tree species that draw on the Montreal Process C&I and will provide basic support for macro carbon monitoring and accounting in the country.
- The United States has used Montreal Process Criterion 5 in organizing and presenting existing carbon-related information and trends, helping to shape national and some state and local carbon estimates and reporting.

50 The report on UNFF 8 is available at www.un.org/esa/forests.

- In Japan, carbon forest inventory reports, and reports on Montreal Process Criterion 5, are sourced largely from data generated through the national forest inventory, which provides detailed data on the status of and change in the volume of standing trees needed to estimate carbon stocks and fluxes.
- Colombia considers some ITTO C&I and FSC P&C in the approval process for projects potentially eligible under the Clean Development Mechanism.

The 2009 Montreal Process report, *A vital process for addressing global forest challenges*, noted that C&I "provide a tool for countries to integrate and understand the effects of climate change on a country's forests, as well as the role of forests in mitigating and adapting to climate change". Criterion 5 and associated indicators have helped member countries to "develop approaches to carbon accounting, enhancing carbon sinks, and increasing consciousness of the importance of sustainable forest management for climate mitigation".

Challenges remain in the REDD+ context to fully apply the concept of SFM and take a holistic view of the multiple benefits of forests, of which carbon storage is only one. C&I can help meet these challenges by providing a framework for placing forest carbon values in the broader context of SFM.

Framework for assessing and monitoring forest governance

One of the most important and innovative aspects of C&I is the inclusion of criteria and/or indicators designed to assess the governance framework needed to achieve SFM. This framework includes forest laws and policies; broader laws and policies related to, for example, land tenure and taxation; transparent and participatory decision-making; and the capacity of forest-related institutions to carry out programs and plans and enforce regulations.

C&I on the legal and institutional framework for SFM[51] form part of the basis of a new initiative by the World Bank Program on Forests (PROFOR) and FAO to develop a framework for assessing and monitoring forest governance in the REDD/REDD+ context. The proposed framework, which was released in March 2011[52], identifies six principles (accountability, effectiveness, efficiency, equity, participation and transparency) and three pillars (policy, legal, institutional and regulatory frameworks; planning and decision-making processes; and implementation, enforcement and compliance). Each pillar has 3–5 subcomponents, and a total of 77 associated indicators apply at the national, subnational and/or FMU levels.

While the structure of the PROFOR–FAO framework is more elaborate and detailed than C&I indicators related to governance and institutional capacity, the nature of the indicators is similar, particularly in the case of the ITTO and Montreal Process C&I. Inputs from ITTO and other C&I processes in the future development of the forest governance framework could be useful. The governance framework could also help inform future C&I reviews and updates.

PC&I for sustainable woodfuel production

Rising energy costs and concerns over carbon emissions from the use of fossil fuels have catalyzed interest in the increased sustainable production of forest-based biofuels as an alternative energy source. In Europe, for example, ambitious targets for renewable energy have led to the greater use of wood for energy, and there are clear signals that this trend will continue in the region. In 2009, a FOREST EUROPE working group on "sustainability criteria" for forest biomass production, including bioenergy, recommended that FOREST EUROPE tools such as the pan-European indicators and PEOLG be refined to further take into account these aspects of sustainability.

Since biofuels are among the wood products flowing from the forest, they are captured in existing sets of C&I, typically under criteria on productive forest functions and socioeconomic forest functions. These criteria encompass indicators on land available for production, growing stock, value/volume of wood products, wood consumption, and the impact of economic use on resource availability – all of which relate to the sustainability of woodfuel production.

51 The 7th thematic element of SFM is "legal, policy and institutional framework".

52 In September 2010, the World Bank, FAO and the Swedish International Development Agency organized an international symposium in Stockholm to consider the development of indicators for forest governance. The PROFOR–FAO framework draws on the symposium's outcomes and subsequent consultations.

Building on these C&I elements, the IEA and FAO launched an initiative to establish standards specifically for intensive sustainable woodfuel production, which encompass all types of biofuel derived directly or indirectly from trees and shrubs (i.e. woody biomass). In 2010, the IEA and FAO published *Criteria and indicators for sustainable wood fuels* (FAO 2010b), which assesses environmental, social, economic, legal and institutional factors in sustainable production and proposes a detailed set of PC&I performance measures for sustainable woodfuel production and harvesting.

Again, input from ITTO and other C&I processes in the future development of the woodfuel PC&I could be useful. The woodfuel PC&I could also help inform C&I reviews/updates on the sustainable use of forest residues, byproducts and fuel crops and factors related to livelihoods, food security and climate-change mitigation. From responses to the government C&I survey it may be assumed that many forest officials are not familiar with their country's activities related to forest-based biofuels. It may be helpful for forest authorities to become more informed about and, if appropriate, involved in discussions on forest-based biofuels.

C&I for SFM as a model for other indicator initiatives related to sustainable development

As recognized in Agenda 21, a range of natural resources and ecosystems in addition to forests are vital for sustainable development and human well-being. In the last several years there has been interest in assessing management trends and broader environmental trends for some of these resources and ecosystems. In responding to the government C&I survey, a few countries reported using C&I for SFM as a model for other indicator initiatives. For example:

- In the United States, the Montreal Process C&I have helped inform the multi-stakeholder development of national C&I frameworks for rangelands, water resources and minerals. The Montreal Process C&I have also been used in discussions on possible C&I for the sustainable management of coral reefs.
- In Côte d'Ivoire, C&I are providing a framework for monitoring and assessing water resources.
- In Togo, C&I are contributing to the integrated management of water resources, the management of grazing land and forest restoration.
- In Canada, C&I have contributed to other national indicator initiatives related to sustainable development, including national environmental indicators.

Drawing on these experiences, there may be scope for other countries to use the forest C&I framework, and lessons learned in implementing C&I, as a reference in developing indicators for other sectors and natural resources at the regional, national and subnational levels.

Indicators for CBD's strategic plan for biodiversity 2011–2020

CBD COP 10 (Nagoya, Japan, October 2010) adopted the Strategic Plan for Biodiversity 2011–2020 to promote the effective implementation of the CBD and provide a "flexible framework for establishing national and regional targets". The plan includes five strategic goals and 20 targets, known as the Aichi Biodiversity Targets, a number of which encompass forests in some way.[53] For example:

- Target 5 – the rate of loss of all natural habitats is halved;
- Target 7 – areas under agriculture, aquaculture and forestry are managed sustainably;
- Target 9 – invasive alien species and pathways are identified and controlled or eradicated;
- Target 11 – terrestrial, inland water, coastal and marine areas are conserved through protected areas;
- Target 14 – ecosystems that provide essential services are restored and safeguarded; and
- Target 15 – ecosystem resilience and carbon stocks are enhanced through conservation and restoration of degraded ecosystems.

In June 2011, an ad hoc expert group developed a broad "indicative list of indicators" to assess trends related to the Aichi Biodiversity Targets and progress toward achieving the Strategic Plan. For

53 The full text of the Strategic Plan for Biodiversity 2011–2020 and Aichi Biodiversity Targets, the database for the "indicative list of indicators", and related reports and documents are available at www.cbd.int.

each target, the indicative list includes one or more "headline indicators" that "present policy relevant information"; for example, Target 7 includes a headline indicator on "trends in pressures from unsustainable agriculture, forestry, fisheries and aquaculture".

Under the headlines are three categories of "operational indicators". Category A and B indicators are for use in assessing trends in targets at the global level. Information on Category A indicators already exists or can be compiled from existing databases or assessments. Category B indicators need further development. Category C indicators are for voluntary use by countries "according to national priorities and circumstances".

The Strategic Plan's indicator framework will be kept under review to allow for additional and improved indicators. This means there is an opportunity for ITTO and FAO in particular to contribute to and enhance the current indicator list based on national C&I data aggregated in Blaser et al. (2011) and FAO (2010a). Such a contribution would strengthen the Strategic Plan's forest-related indicators, as well as linkages with C&I frameworks. It would also advance joint work under the March 2010 ITTO–CBD memorandum of understanding, which includes a focal area on "examining opportunities for harmonized reporting on sustainable use and conservation of tropical forests".

7 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The following conclusions are drawn from responses to the government and private/non-government surveys, which together represent a broad cross-section of countries and stakeholders. They also draw on ITTO ex-post evaluations of C&I projects in Asia and recent international forest assessment reports (e.g. ITTO 2011 and FAO 2010a) and C&I collaborative meetings, as well as other information contained in this report.

Overall

- The forest sector has been a leader and in many ways a laboratory for understanding and addressing the complex issues associated with the sustainable management of renewable natural resources and their contributions to sustainable development.
- C&I for SFM have been an important innovation in this regard, enabling countries and the international community to understand and operationalize the evolving concept of SFM. Significant progress has been made in developing C&I as a policy instrument since the concept was pioneered by ITTO in the early 1990s. C&I are not an end in themselves but a tool for adapting management so that forests deliver the range of needed goods and services.
- The sets of C&I currently in active use under five C&I processes are conceptually similar, reflecting a holistic approach to forests as ecosystems that provide multiple benefits. Criteria are the essential components of SFM and indicators are ways to measure them. The criteria common to C&I processes led to the identification of the "seven thematic elements of SFM".
- At the same time, C&I sets differ in structure, level of detail, the types of forest addressed and, most significantly, the existence of FMU-level C&I, which have been developed only by tropical C&I processes. These variations affect how C&I are used and applied.
- Differences among countries in terms of forest governance structures, ownership patterns, existing policy frameworks and forestry traditions, as well as capacity issues, also affect how countries use and apply C&I.
- While process-level C&I provide a common reference framework for participating countries, it is often useful for countries to step-down or otherwise adapt process C&I to reflect national and/or FMU conditions and circumstances, for example by developing national/FMU-specific C&I.

Monitoring, assessment and reporting

- C&I provide a common policy tool to assist countries in monitoring, assessing and reporting on trends in forest conditions and progress toward SFM at various levels, while allowing for differences within and across countries.
- ITTO producers, often with ITTO support, and other countries have made progress in using C&I for MAR, which is reflected in improvements in forest inventories and databases, systems of data collection and analysis, and the information available at the national, subnational and FMU levels.
- National and FMU trends apparent from the monitoring of indicator data have helped agencies and FMU managers identify weaknesses in forest management and make adjustments, for example in harvesting quotas and practices. Some concessionaires have used FMU C&I to assess and monitor high-conservation-value forests and the protective functions of forest resources.
- Improvements in the quality, coverage and consistency of C&I data from an increasing number of countries has led to more comprehensive regional and global forest assessments, such as SFM Tropics, FRA and the State of Europe's Forests. Countries using C&I for MAR tend to be well-positioned to respond to external forest-related reporting requests.

Contributions to SFM

- While the contributions of C&I to SFM vary considerably by country, C&I have had an overall positive impact and have contributed in a variety of ways, sometimes significantly, to

improved forest management and the expansion in the area of forest under SFM.

- C&I have increased awareness of forest benefits beyond timber and fiber production and highlighted the importance of governance systems that integrate the economic, social and environmental values of forests, including through cross-sectoral coordination and the meaningful involvement of stakeholders at all levels.
- The impact of C&I on SFM has generally been greater in countries that, with stakeholder involvement, have incorporated C&I approaches into the laws, policies, programs, strategies, guidelines and standards that govern forest practices.
- FMU-level C&I in particular have provided a basis for a number of ITTO producers, often with ITTO support, to formulate, approve and monitor compliance with FMPs, best management practices and concession contracts, agreements and permits.
- Innovative applications of C&I in the areas of research, education, conservation financing and environmental assessments have also had a positive impact on SFM in some countries, as has the use of FMU C&I by public and private operators as a tool for training forest managers and workers in the concepts and implementation of SFM.
- C&I have contributed to (and in many cases provided a basis for) forest certification, which has expanded significantly in recent years in response to demands in key markets for sustainably and legally harvested products. The application of C&I at the FMU level has helped private operators move toward certification, reflecting the linkages between C&I and certification standards.
- While certified forest operators are obliged to meet requirements consistent with SFM as a condition of certification, they may also continue to find aspects of FMU-level C&I useful.

Challenges encountered

- Despite progress in operationalizing C&I, all countries, particularly tropical producers and other developing countries, face challenges in applying C&I due to insufficient capacity, commitment, policy frameworks and stakeholder engagement. For example, while all countries are able to collect data on some indicators, very few countries can report on all indicators.
- The specific nature and extent of the challenges vary widely by country. Some challenges can only be addressed internally by raising the priority of forests on national agendas. Others can be facilitated through increased international cooperation, public–private partnerships, and collaborative initiatives among C&I processes and associated countries.
- Strengthening the ability of countries to collect data and report on indicators, and to integrate C&I into policies and programs at an operational level, will continue to be important for SFM decision-making in many regions.
- Existing sets of C&I may present challenges for some users. FMU indicators in particular may benefit from review regarding their suitability and feasibility for use by local communities and small forest enterprises.

Global developments and emerging issues

- C&I are playing a role in wider forest-related developments and issues, including as a foundation for international initiatives to assess forest governance in the context of REDD and to establish PC&I for sustainable intensive woodfuel production. C&I are also relevant to the assessment of forest-related trends under the Aichi Biodiversity Targets.
- At the national level, C&I are considered in the national forest carbon calculations of a number of countries and in related efforts to place carbon values in the broader context of SFM. C&I frameworks have served as models for developing national environmental indicators and for C&I for other natural resources, such as rangelands/grasslands, water resources and minerals.
- The value and contributions of C&I in addressing forest-related global challenges are increasingly evident and warrant further attention. Greater input from ITTO and other C&I processes and experts into recent initiatives could be useful.

ITTO leadership

- ITTO has been the single biggest supporter of C&I for SFM training, testing and implementation in the tropics. A number of producer countries could benefit from continued ITTO assistance, for example to adapt ITTO C&I to national/FMU circumstances, engage stakeholders and strengthen databases and monitoring systems, particularly for social and environmental indicators.
- Other potential sources of C&I financing, including FAO, the GEF and the World Bank, could contribute significantly to national efforts and complement ITTO project support.
- ITTO's C&I would benefit from review and update to take into account the experiences of member countries, progress under other C&I processes, and relevant trends and developments.
- Given ITTO's long experience with C&I, greater collaboration with FAO, other CPF members and C&I processes would further promote learning, innovation and cooperative activities (e.g. joint reporting) and increase the contribution of C&I to global developments and emerging issues.

Recommendations

To continue and strengthen its work and leadership on C&I and the contribution of C&I to SFM, ITTO may wish to consider the following activities.

Strengthen the impact of the ITTO C&I in the field

- Organize additional national and sub-regional consultations or workshops involving private stakeholders to focus strategically on C&I uptake at the FMU level, including by identifying specific challenges and ways to meet them, such as by:
  - adapting ITTO C&I to FMU circumstances in individual countries
  - establishing mechanisms for effective stakeholder communication and outreach
  - identifying capacity-building priorities for data collection and analysis
  - establishing demonstration forests for the application of FMU C&I
  - exploring linkages between FMU C&I and applicable certification standards, including the TFF's RIL standard, and the potential for harmonization in individual countries.
- Incorporate C&I uptake into components of ITTO's thematic programs that address MAR and progress toward SFM.

Review ITTO's national and FMU C&I

- Initiate a process to comprehensively review and, as needed, improve the ITTO C&I (i.e. the version published in 2005) based on lessons learned and recent developments, taking into account: 1) ITTO's revised guidelines for the sustainable management of natural tropical forests and other relevant guidelines; 2) recent indicator updates by other C&I processes, in particular the Montreal Process; 3) the seven thematic elements of SFM; 4) trends in certification and local control of forests; and 5) relevant global developments and emerging issues related to, among other things, climate, bioenergy and biodiversity. Consideration might be given to:
  - streamlining aspects of the national- and FMU-level C&I
  - identifying a core set of indicators for use by local/indigenous community forest managers
  - further elaborating indicators related to sustainable woodfuel production, the contribution of forests to carbon cycles, and forest governance
  - exploring linkages between FMU C&I and certification standards
  - exploring connections among the ITTO, ATO/ITTO and Tarapoto C&I and the feasibility/merits of enhanced convergence.

Strengthen partnerships and collaboration with CPF members and C&I processes

- Engage with the IEA, FAO and PROFOR on their respective initiatives to establish a framework for assessing and monitoring forest governance in the context of REDD+ (FAO–PROFOR) and develop PC&I for sustainable woodfuel production (IEA–FAO). Invite

representatives to make presentations on the status of these initiatives at the next session of the International Tropical Timber Council.

- Work with the CBD secretariat in the context of the ITTO–CBD memorandum of understanding and with the FAO Forestry Department to identify indicators for the forest-related components of the Aichi Biodiversity Targets, for which C&I baseline information is available through SFM Tropics 2011 and FRA 2010.
- Organize an expert meeting with FAO, other CPF members, the Montreal Process Working Group, FOREST EUROPE and representative countries to:
  - finalize a joint forest questionnaire for national reporting for FRAs and SFM Tropics and develop joint data-collection schedules and methodologies
  - explore the use of the joint questionnaire as a framework for forest-related reporting to other CPF members
  - exchange experiences and lessons learned on applying C&I at various levels and for various purposes
  - examine how C&I can help countries address developments and emerging issues related to climate, bioenergy, biodiversity, etc.
  - establish a regular framework of communication on C&I and related SFM issues.
- Organize, in collaboration with FAO, the World Bank, the GEF and other relevant CPF members, a joint expert consultation to identify ways to improve and expand international financial, technical and scientific cooperation on C&I, including by tapping into climate-related sources of funding.
- Urge ITTO focal points to facilitate coordination between national forest authorities and focal points for REDD+, the CBD, the GEF and the UNCCD to highlight the contributions of C&I to forest-related work under the Rio conventions, avoid the duplication of effort in the development of forest-related indicators and measures, and generate funding for C&I implementation to complement ITTO support.
- Encourage ITTO members to give greater priority to FMU C&I implementation in ITTO thematic programs and in project proposals financed through the Special Account, as well as in projects financed through bilateral cooperation, FAO and the GEF.

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Annex 1

Members/participants in five C&I processes: ITTO, ATO/ITTO, Tarapoto Process, FOREST EUROPE and Montreal Process (as of 2012)

ITTO (producer members)

Africa

Cameroon, Central African Republic, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Gabon, Ghana, Liberia, Nigeria, Togo

Asia/Pacific

Cambodia, Fiji, India, Indonesia, Malaysia, Myanmar, Papua New Guinea, Philippines, Thailand, Vanuatu

Latin America/Caribbean

Bolivia, Brazil, Colombia, Ecuador, Guatemala, Guyana, Honduras, Mexico, Panama, Peru, Suriname, Trinidad and Tobago, Venezuela

ATO/ITTO

Angola, Cameroon, Central African Republic, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Ghana, Honduras, Liberia, Nigeria, Sao Tome et Principe, Tanzania

Tarapoto Process (ACTO members)

Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, Venezuela

FOREST EUROPE

Albania, Andorra, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, European Commission, Finland, France, Georgia, Germany, Greece, Holy See, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Republic of Moldova, Romania, Russian Federation, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, The Former Yugoslav Republic of Macedonia, Turkey, Ukraine, United Kingdom

Montreal Process

Argentina, Australia, Canada, Chile, China, Japan, Mexico, New Zealand, Republic of Korea, Russian Federation, United States of America, Uruguay

Annex 2

Cross-reference of national-level criteria from five C&I processes and the seven thematic elements of SFM

7 Thematic Elements of SFM (2004)	ITTO National Criteria (2005)	Tarapoto Process "Very Applicable" National Criteria (2005)	ATO/ITTO National Level Principle 1 & related Criteria (2001/2003)	Pan-European Criteria (1994)	Montreal Process Criteria (1995)
1 .Extent of forest resources *In FRA 2010 this includes the contribution of forests to global carbon cycles*	2. Extent & condition of forests	Conservation of forest cover & biodiversity *Also international criterion on economic, social & environ-mental services of the Amazon forest*	*Not addressed directly*	1. Maintenance & appropriate enhancement of forest resources & their contribution to global carbon cycles	5. Maintenance of forest contribution to global carbon cycles
2. Forest biological diversity	5. Biological diversity	Conservation of forest cover & biodiversity	FMU Principle 3 and relevant FMU level criteria (normative)	4. Maintenance, conservation & appropriate enhancement of biological diversity in forest ecosystems	1. Conservation of biological diversity
3. Forest ecosystem health & vitality	3. Forest ecosystem health	*FMU criterion – Conservation of forest ecosystems*	*FMU Principle 3 and relevant FMU level criteria*	2. Maintenance of forest ecosystem health & vitality	3. Maintenance of forest health & vitality
4. Productive functions of forests	4. Forest production	*FMU criterion – Sustainable forest production*	*FMU Principle 2 and relevant FMU level criteria*	3. Maintenance & encouragement of productive functions of forests (wood & non-wood)	2. Maintenance of production capacity of forest ecosystems
5. Protective functions of forests	6. Soil & water protection	*FMU criterion – Conservation of forest ecosystems*	*FMU Principle 3 and relevant FMU criteria*	5. Maintenance & appropriate enhancement of protective functions in forest management (notably soil & water)	4. Conservation & maintenance of soil & water resources
6. Socioeconomic functions of forests	7. Economic, social & cultural aspects	*International criterion on economic, social & environmental services of the Amazon forest*	*FMU Principle 4, and relevant FMU level criteria*	6. Maintenance of other socio-economic functions and conditions	6. Maintenance & enhancement of long-term multiple socioeconomic benefits to meet needs of societies
7. Legal, policy & institutional framework	1. Enabling conditions for SFM	Policies & juridical & institutional framework for sustainable forest development Science & technology for sustainable forest development	Principle 1: Sustainable forest utilization & maintenance of multiple functions of forests are high political priority *(includes 5 criteria on State policies & capacity for SFM)*	*Qualitative indicators for (a) overall policies, institutions, instruments for SFM & (b) specific policy areas under Criteria 1-6 (agreed 2002)*	7. Legal, institutional & economic framework for forest conservation and SFM

Annex 3
Cross-reference of FMU-level criteria from three C&I processes

ATO/ITTO FMU principles 2003	ATO/ITTO FMU criteria 2003	ITTO FMU criteria 2005	Tarapoto FMU criteria 2004
Principle 2: The FMU, designated for whatever form of land use, is sustainably managed with a view to supplying required goods & services	2.1 Forest management complies with national policies and legislation in force in the country where it is implemented and with all treaties the country has ratified	1. Enabling conditions for SFM 4. Forest production	
	2.2 FMU is managed with well-defined & clearly established objectives compatible with SFM	1. Enabling conditions for SFM 4. Forest production	Juridical & institutional framework
	2.3 Sustainable production of timber is ensured both in quantity & quality	4. Forest production	
	2.4 Silvicultural techniques implemented in FMU are compatible with objectives for SFM & well adapted to needs of management in FMU & expected production	4. Forest production 7. Enabling conditions for SFM	Sustainable forest production
	2.5 Within the FMU, NTFPs are harvested on a sustainable basis, in consultation with stakeholders	1. Enabling conditions for SFM 4. Forest production	
	2.6 Forest management is revised periodically or when necessary due to unforeseen circumstances	1. Enabling conditions for SFM	Juridical & institutional framework
Principle 3: The main ecological functions of the forest are maintained	3.1 Sustainable management of forest resources is based on a dynamic acquisition of knowledge on ecology	1. Enabling conditions for SFM 7. Economic, social & cultural aspects	National criterion
	3.2 The impact of harvesting activities on the structure of the forest is minimized	3. Forest ecosystem health 4. Forest production	
	3.3 The impact of harvesting on biodiversity is minimized	5. Biological diversity	Conservation of forest ecosystems
	3.4 The natural regeneration capacity of the forest is ensured	3. Forest ecosystem health 4. Forest production	
	3.5 The impact of harvesting of water, soils & slopes is minimized	6. Soil & water protection	Conservation of forest ecosystems
Principle 4: According to the importance & intensity of forest operations, FMU manager con- tributes to improving economic & social well-being of workers in the FMU & local populations	4.1 Rights & responsibilities of workers in the FMU & local populations are clearly defined, acknowledged & respected	7. Economic, social & cultural aspects	
	4.2 Concessionaire encourages participation of local populations present in the FMU in the management of forest resources	1. Enabling conditions for SFM 7. Economic, social & cultural aspects	
	4.3 All stakeholders consider the share of benefits derived from forests to be satisfactory	7. Economic, social & cultural aspects	
	4.4 According to importance & impact of forest operations, the concessionaire contributes to improving health & education of local populations	7. Economic, social & cultural aspects	

Annex 4
ITTO government C&I survey

ITTO SURVEY ON THE USE/APPLICATION OF
CRITERIA AND INDICATORS FOR SUSTAINABLE FOREST MANAGEMENT
AT FIELD AND OTHER OPERATIONAL LEVELS

SURVEY FOR NATIONAL AND SUBNATIONAL GOVERNMENT AGENCIES

1. YOUR COUNTRY & AGENCY_____ _____

1(a) YOUR NAME, TITLE & EMAIL _____ _____ _____

2. YOUR AGENCY'S LEVEL OF GOVERNMENT (check one):

National☐ State☐ Province☐ Prefecture ☐ Local☐ Other (describe)_____

3. HECTARES OF FOREST DIRECTLY OWNED OR MANAGED BY YOUR AGENCY_____

3(a) Are these forests certified? Yes ☐ No☐. If Yes, under what scheme(s):
FSC ☐ SFI☐ PEFC☐ Other (list) _____

4. HECTARES OF FOREST REGULATED OR CONTROLLED BY YOUR AGENCY NOT INCLUDED IN ITEM 3 _____

5. WHICH C&I PROCESS(ES) ARE YOU FAMILIAR WITH? (check all that apply)

ITTO☐ ATO☐ Tarapoto Process☐ Forest Europe☐ Montreal Process☐

6. WHICH C&I PROCESS(ES) IS YOUR COUNTRY CLOSELY ASSOCIATED WITH?

ITTO☐ ATO☐ Tarapoto Process☐ Forest Europe☐ Montreal Process☐

7. DOES YOUR AGENCY USE/APPLY C&I DRAWN FROM THE C&I PROCESS(ES) CHECKED IN ITEM 6 AS A BASIS OR FRAMEWORK FOR THE FOLLOWING ACTIVITIES:

7(a) Do you use/apply C&I as a basis/framework for forest monitoring and assessment? Yes☐ No☐. If Yes, at what level(s):

National☐ Subnational☐ Local☐ FMU☐. Please describe:_____
_____
_____
_____

7(b) Do you use/apply C&I as basis/framework for reporting on forests? Yes☐ No☐. If Yes, at what level(s):

Global☐ Regional☐ National☐ Subnational☐ Local☐ FMU☐. Please describe:
_____
_____
_____
_____

7(c) Do you use/apply C&I as basis/framework for strategic forest planning? Yes☐ No☐.
If Yes, at what level(s)?
National☐ Subnational☐ Local☐ FMU☐. Please describe_____
_____
_____
_____

7(d) Do you use/apply C&I as basis/framework for regulating forest management? Yes☐ No☐. If Yes, at what level(s)?

National☐ Subnational☐ Local☐ FMU☐. Please describe:
_____
_____
_____

Do these regulations cover (check all that apply): All forests☐ Government forests☐ Private forests☐
Protected forests ☐ Planted/plantation forests☐ Concession forests☐ Timber producing forests☐

7(e) Do you use/apply C&I as basis/framework for developing/establishing best management practices?
Yes☐ No☐. If Yes, at what level(s)?

National☐ Subnational☐ Local☐ FMU☐. Please describe: _____
_____
_____
_____

Do these best practices cover (check all that apply): All forests☐ Government forests☐ Private forests☐ Protected forests ☐ Planted/plantation forests☐ Concession forests☐ Timber producing forests☐

7(f) Do you use/apply C&I as basis/framework for developing forest management certification schemes or other performance standards? Yes☐ No☐. If Yes, at what level(s):

Global☐ National☐ Subnational☐ Local☐ FMU☐. Please describe
_____
_____
_____
_____

Do these schemes/standards cover (check all that apply): All forests☐ Government forests☐ Private forests☐ Protected forests☐ Planted/plantation forests☐ Concession forests☐ Timber producing forests☐

7(g) Please describe any other ways your agency is using C&I: _____
_____
_____
_____
_____

8. DO/DID ANY ACTIVITIES CHECKED IN ITEM 7 INVOLVE STAKEHOLDER CONSULTATION?
Yes ☐ No ☐. If yes, please describe_____
_____
_____
_____
_____

9. PLEASE INDICATE SIGNIFICANT CONSTRAINTS OR ISSUES ENCOUNTERED IN UNDERTAKING THE ACTIVITIES IN ITEM 7:
☐ lack of financial resources ☐ lack of technical resources ☐ lack of political will ☐ legal limitations
☐ problems with forest land tenure ☐ multiple forest ownerships (public and/or private)
☐ multiple layers or levels of government (national, subnational, local, etc) ☐ conflict among stakeholders ☐ lack of understanding of concept and purpose of C&I ☐ Other (specify)_____

What were the 2 biggest constraints/issues and why?
_____
_____
_____

10. IS YOUR COUNTRY TAKING INTO ACCOUNT THE C&I RELATED TO THE PROCESS(ES) CHECKED IN ITEM 6 IN ANY OF THE FOLLOWING ACTIVITIES?

10(a) Carbon accounting methodologies: Yes ☐ No ☐ Don't know ☐.
If yes, please describe:_____
_____
_____

10(b) Sustainability criteria for biofuels production: Yes ☐ No ☐ Don't know ☐
If yes, please describe: _____
_____
_____

10(c) Criteria and indicators for sustainable management of other natural resources (e.g. water, rangelands, coral reefs): Yes ☐ No ☐ Don't know ☐. If yes, please describe:_____
_____
_____
_____

11. HAS THE USE OF C&I IMPROVED FOREST MANAGEMENT PRACTICES IN YOUR COUNTRY?
Yes ☐ No ☐. If Yes, to what extent: Greatly ☐ Moderately ☐ Slightly ☐.
Comment:_____
_____
_____
_____

12. IF THERE ARE FURTHER COMMENTS OR INFORMATION YOU WOULD LIKE TO PROVIDE RELATED TO C&I, PLEASE DO SO HERE: _____
_____
_____
_____
_____
_____

Annex 5

Letter from ITTO Executive Director to ITTO focal points requesting contact information for government officials to receive the ITTO C&I survey

Note: Annexes 1 and 2 referred to in this cover letter are not included here as part of Annex 5. The final government C&I survey is contained in Annex 4 of this report. The complete list of government survey recipients and respondents is contained in Annex 6.

2 February 2011
Ref. No. L.11-XXX

Dear ITTO focal points,

I am writing to seek your assistance with an important new ITTO global study on the ***Use and Effectiveness of Criteria and Indicators for Sustainable Forest Management in Improving Forest Management at the Forest Management Unit (FMU) and Other Operational Levels***. You will recall that at the Forty-sixth Session of the International Tropical Timber Council (ITTC) held in December 2010, you received a preliminary report on this important study from Ms. Stephanie Caswell who is assisting us with this study.

It is widely agreed that C&I are effective tools for monitoring, assessment and reporting on forest trends and progress toward SFM at the national level, including for national reporting to international organisations. However, less is commonly understood about the extent to which C&I have had and are having a positive impact on forest management practices and SFM on the ground.

Assessing these impacts is particularly timely considering the current international context. This includes, *inter alia*, ongoing climate talks on REDD+ and related carbon accounting; the Convention on Biological Diversity's new Strategic Plan (and related targets & indicators) to halt loss of biodiversity by 2020, including forest biodiversity; discussions in various fora on the development of C&I for biofuels; the new World Bank-FAO initiative to develop indicators for forest governance; recent developments in various C&I processes; and the International Year of Forests 2011 which will shine a spotlight on forests worldwide.

As your know, ITTO has been a pioneer and leader on C&I since the early 1990's, investing over US$ 30 million to help train and assist member countries in implementing C&I at both the national and FMU levels. With this study, the Organisation continues its leadership role by examining the relevance and contribution of C&I as tools for promoting SFM in the field.

As noted at Forty-sixth Session of the ITTC, the study will focus on the following five processes which have taken significant steps to operationalise C&I and which involve producer and consumer members of ITTO:

ITTO

- African Timber Organisation (ATO)/ITTO Principles, criteria and indicators
- Tarapoto Process (Amazon)
- Forest Europe (formerly MCPFE)
- Montreal Process (countries outside Europe with temperate & boreal forests)

REQUEST TO ITTO MEMBERS

In order to gather the necessary information, we will be widely circulating two questionnaires to, respectively: (1) government agencies at national and subnational levels with forest management responsibilities, and (2) private companies and operators and other significant non-government forest managers, such as local communities.

The government agency questionnaire has been finalized and is attached for your information in Annex 1. Annex 2 contains a partial list of agency contact information for individuals within your country who may be appropriate recipients for the government survey.

You are kindly requested to confirm, update or expand as needed the list of contacts for your country in Annex 2, including email addresses, and provide your corrections and additions to Dr. Steve Johnson (johnson@itto.int) of the ITTO Secretariat by **15 February 2011**.

We rely on your timely response to this request so that we may circulate the survey to appropriate agencies in ITTO member countries as soon as possible.

I thank you in advance for your input and assistance with this important and ambitious project and look forward to reporting results to you at the Forty-seventh Session of the ITTC in Guatemala in November 2011.Sincerely yours,

Emmanuel Ze Meka
Executive Director

Annex 6
List of government survey recipients and respondents

COUNTRY	NAME & AGENCY	REPLY
Argentina	Mirta Larrieu, Ministry of Agriculture	
	Tomas Schlichter, Instituto Nacional de Tecnologia Agropecuariari (INTA)	O
Australia	Andrew Wilson, Department of Agriculture, Fisheries and Forestry	
	Queensland Department of Primary Industries	
	Kris Gounder, Forests New South Wales	
	Stuart West, Forestry South Australia	
	Nathan Trushell, VicForests	
	Forest Products Commission of Western Australia	
Austria	Peter Mayer, Federal Research and Training Centre for Forests, Natural Hazards and Landscape (BFW), Federal Office for Forests	O
	Ingwald Gschwandtl, Federal Ministry of Agriculture, Forestry, Environment and Water Management	
Belgium	No contact provided by ITTO focal point	
Bolivia	No contact provided by ITTO focal point	
Brazil	Joberto Freitas, Brazilian Forest Service	O
Cambodia	No contact provided by ITTO focal point	
Cameroon	No contact provided by ITTO focal point	
Canada	Jennifer Hollington, Natural Resources Canada, Canadian Forest Service	O
	Daryl Price, Forestry Division, Sustainable Resource Development, Alberta	O
	Patrick Martin, Forest Analysis and Inventory Branch, Ministry of Forests, Mines and Lands, British Colombia	O
	Julie Ringash, Manitoba	
	Tom Ng, New Brunswick	
	Wayne Kelly, Newfoundland	
	Bill Mawdsley, Northwest Territory	
	Jorg Beyeler, Nova Scotia	
	Bill Dalton, Ministry of Natural Resources, Ontario	O
	Brian Brown, Prince Edward Island	
	Luc Laberge for Anne Stein, Ministère des Ressources Naturelles et de la Faune du Québec	O
	Dwayne Dye, Saskatchewan	
	Robin Sharples, Forest Management Branch, Yukon	O
Central African Republic	No contact provided by ITTO focal point	
Chile	Angelo Sartori, Corporacion Nacional Forestal (CONAF), Ministerio del Agricultura	O
China	Huang Qinglin, Institute of Forest Resource Information Techniques, Chinese Academy of Forestry	O
	Zhang Min, Department of Forest Resources, State Forestry Administration	O
Colombia	Xiomara Sanclemente Manrique, Luz Stella Pulido Pérez and Rubén Darío Guerrero Useda, Ministerio de Ambiente, Vivienda y Desarrollo Territorial	O
	Luis Alfonso Escobar Trujillo and Germán León Ríos Arias, Corporación Autónoma Regional del Centro de Antioquia (CORANTIOQUIA)	O
	Jeimy Cecilia Rodríguez Martínez and Luis Alfonso Guzmán Lopez, Corporación Autónoma Regional del Valle del Cauca	O
Côte d'Ivoire	Ben Salah Boubacar, SPIB	
	Yao Benoît Brou, Ministère de l'Environnement, des Eaux et Forêts	
	Martial Me Kouamé, SODEFOR	O

Croatia	Ivica Grbac, Ministarstvo Regionalnog Razvoja, Šumarstva i Vodnoga Gospodarstva	
	Srecko Juričić, Ministarstvo Regionalnog Razvoja, Šumarstva i Vodnoga Gospodarstva	
	Goran Gregurovic, Ministarstvo Regionalnog Razvoja, Šumarstva i Vodnoga Gospodarstva	
Democratic Republic of the Congo	No contact provided by ITTO focal point	
Denmark	Christian Jensen, Danish Forest and Nature Agency	
Ecuador	No contact provided by ITTO focal point	
Egypt	No contact provided by ITTO focal point	
European Union	No contact provided by ITTO focal point	
Fiji	No contact provided by ITTO focal point	
Finland	Jari Parviainen, Finnish Forest Research Institute (METLA)	O
France	Jacques Andrieu, Direction Générale des Politiques Agricole, Agroalimentaire et des Territoires, Ministère de l'Agriculture, de l'Alimentation, de la Pêche, de la Ruralité et de l'Aménagement du Territoire	
Gabon	No contact provided by ITTO focal point	
Germany	Matthias Schwoerer, International Forest Policy Division, Federal Ministry of Food, Agriculture and Consumer Protection	
Ghana	No contact provided by ITTO focal point	
Greece	General Director for Development and Protection of Forests and Natural Environment	
	Director for Development of Forest Resources	
	Head of Section for Planning of Forest Resources	
Guatemala	Adelso Revolorio Quevedo, Coordinador Unidad de Planificación, Instituto Nacional de Bosques (INAB)	
	Luis Pereira Rodas, Gerente, Consejo Nacional de Estándares de Manejo Forestal Sostenible para Guatemala (CONESFORGUA)	
	Mario Rivas, Asociación de Comunidades Forestales de Petén (ACOFOP)	
	William Melgar, Direccion de Operaciones, INAB	O
	Juventino Gálvez, Universidad Rafael Landívar, Instituto de Agricultura, Recursos Naturales y Ambiente (IARNA)	
Guyana	Edward Goberdhan, Finance Division, Guyana Forestry Commission	O
Honduras	José Trinidad Suazo, Instituto Nacional de Conservación y Desarrollo Forestal (ICF)	
	José Antonio Galdames, Instituto Nacional de Conservación y Desarrollo Forestal (ICF)	
	Miguel Conrado Valdez, ESNACIFOR	
	Leila Orellana, Consultor Ambiental	
	Jose Muñoz, Industrias Sansone	
	Fausto Lazo, Cooperación Alemana GIZ	
	Carlos Amaya, Colegio de Ingenieros Forestales de Honduras	
	Manuel Vlichez, Colegio de Profesionales Forestales de Honduras	
	Miguel Mendieta, Instituto Nacional de Conservación y Desarrollo Forestal (ICF)	O
Hungary	Andras Szepesi, Forest Policy Advisor, Ministry of Rural Development, Department of Forestry, Fishing and Hunting	
Iceland	Jón Geir Pétursson, Ministry for the Environment	
	Jon Loftsson, Iceland Forest Service	
India	No contact provided by ITTO focal point	
Indonesia	No contact provided by ITTO focal point	
Ireland	Peter Cafferkey, Department of Agriculture, Fisheries and Food	
Italy	Giorgio Corrado, Ministry of Agriculture, Food and Forestry Policies	
Japan	Takeshi Goto, Forestry Agency, Ministry of Agriculture, Forestry and Fisheries	O

Liberia	No contact provided by ITTO focal point	
Malaysia	Chew Lye Teng, Malaysian Timber Certification Council	O
	Musa Salleh, Sabah Forestry Department	O
	Hamden Mohamad, Sarawak Forest Department	O
Mexico	Jose Armando Alanis de la Rosa, Director de Cooperacion, Comisión Nacional Forestal (CONAFOR)	O
Myanmar	39 contacts provided by ITTO focal point with note that a short list would follow. Short list yet to be received.	
Nepal	No contact provided by ITTO focal point	
Netherlands	No contact provided by ITTO focal point	
New Zealand	Alan Reid, Ministry of Agriculture and Forestry	O
	Warwich Foran, Crown Forestry Unit, Ministry of Agriculture and Forestry	O
	Jeff Flavell, Research & Development Group National Office, Department of Conservation	O
	Harry Maher, Commercial Business Unit, Department of Conservation	O
Nigeria	No contact provided by ITTO focal point	
Norway	Knut Øistad, Department of Forest and Natural Resource Policy, Ministry of Agriculture and Food	O
Panama	No contact provided by ITTO focal point	
Papua New Guinea	No contact provided by ITTO focal point	
Peru	Jorge Ugaz Gomez, Dirección General Forestal y de Fauna Silvestre, Ministerio de Agricultura	O
	Jorge Malleux, Consultor	O
	Carlos Liñares, Consultor	O
	Nelson Kroll, Asesor forestal de MADERACRE SAC	
	Milo Bozovich, Decano de la Facultad de Ciencias Forestales de la Universidad Nacional Agraria La Molina	
Philippines	No contact provided by ITTO focal point	
Poland	Edward Lenart, Ministry of the Environment	
Portugal	Conceicao Ferreira, Ministry of Agriculture	
Republic of Congo	No contact provided by ITTO focal point	
Republic of Korea	Seung Hak Lee, Korea Forest Service	O
	Chong Se-Kyung, Korea Forest Research Institute	
Russian Federation	Maria Palenova, Federal Forestry Agency	O
Slovenia	Aleksander Golob, Ministry for Agriculture, Forestry and Food	O
Spain	José María Solano López, Jefe del Área de Planificación y Ordenación Forestal, Ministerio de Medio Ambiente y Medio Rural y Marino	
Suriname	No contact provided by ITTO focal point	
Sweden	Björn Merkell, Swedish Forest Agency	O
Switzerland	Christian Kuechli, International Affairs Division, Federal Office for the Environment, Federal Department of the Environment, Transport, Energy and Communications	
Thailand	No contact provided by ITTO focal point	
Trinidad & Tobago	No contact provided by ITTO focal point	
Togo	Hèmou Assi, Office de Developpement et d'Exploitation des Forets (ODEF)	O
	Kouami Kokou, Faculte des Sciences, Laboratoire de Botanique/Ecologie, Université de Lomé	O
	Oyetoundé Djiwa, DP/MERF	O
Turkey	Ismail Belen, Deputy Director General for Forestry, Ministry of Environment and Forestry	
	Serdar Yegül, Ministry of Environment and Forestry	
United Kingdom	Mike Dudley, UK Forestry Commission	O

United States of America	Guy Robertson, United States Forest Service	O
	Connie Carpenter, International Institute of Tropical Forestry, United States Forest Service	
	David Mormon, Oregon Department of Forestry	O
	Donald Outen, Department of Environmental Protection and Sustainability, Baltimore County, Maryland	O
	Michael Buck, National Association of State Foresters	O
Uruguay	Daniel San Roman, Dirección General Forestal, Ministerio de Ganaderia, Agricultura y Pesca	
Vanuatu	No contact provided by ITTO focal point	
Venezuela	No contact provided by ITTO focal point	

**Countries in italics were not ITTO members in in 2011.*

Annex 7

ITTO private/non-government C&I survey

ITTO SURVEY ON THE USE/APPLICATION OF
CRITERIA AND INDICATORS FOR SUSTAINABLE FOREST MANAGEMENT
AT FIELD AND OTHER OPERATIONAL LEVELS

FOR CORPORATE, COMMUNITY AND INDIVIDUAL FOREST AND TIMBERLAND OWNERS, MANAGERS AND OPERATORS, ASSOCIATIONS AND CERTIFIERS

Note: Criteria and indicators (C&I) for sustainable forest management are tools to monitor, assess and report on forest management trends and progress toward sustainable forest management at national and field/forest management unit (FMU) levels.

1. YOUR NAME, TITLE, EMAIL ADDRESS: _____
_____

2. NAME AND LOCATION (INCLUDE COUNTRY) OF YOUR ORGANIZATION: _____
_____

3. WHICH OF THE FOLLOWING BEST DESCRIBES YOUR ORGANIZATION?

(a) _____ Timber production company/operator
(b) _____ Local community
(c) _____ Timber investment management organization (TIMO) or Real Estate Investment Trust (REIT)
(d) _____ Association of timber producing companies
(e) _____ Association of individual and corporate forest land owners
(f) _____ Association of family and small-scale forest owners
(g) _____Forest certification program or scheme
(h) _____ Other. Please describe: _____
_____

4. TOTAL HECTARES (1 hectare=2.47 acres) OF FOREST LAND YOUR ORGANIZATION ---

(a) _____ Owns
(b) _____ Manages under lease/concession. From whom (e.g. name of government agency): _____
_____
(c) _____ Co-manages. With whom: _____
(d) _____ Manage under other arrangements. Please explain: _____
_____
_____
(e) _____ None/not applicable. PLEASE SKIP TO ITEM 9.

5. DOES YOUR ORGANIZATION OWN OR MANAGE TIMBER PRODUCING FORESTS IN MULTIPLE JURISDICTIONS OR COUNTRIES? Yes ____ No ____. If yes, please explain: _____
_____
_____

6. DO NATIONAL OR SUBNATIONAL LAWS OR REGULATIONS OR THE CONDITIONS OF YOUR LEASE OR CONCESSION REQUIRE ANY OF THE FOLLOWING (check all that apply):

(a) _____ Your forest area(s) must be sustainably managed
(b) _____ Your timber harvest operations must be carried out in accordance with a set of best management practices
(c) _____ Your timber harvest operations must be planned and carried under an approved forest management plan
(d) _____ Other requirements. Please specify: _____
_____
_____

7. ARE YOUR FOREST MANAGEMENT AND TIMBER HARVESTING OPERATIONS CERTIFIED? Yes ____ No ____ If Yes, under which certification scheme (check all that apply):

(a) _____ FSC (Forest Stewardship Council)
(b) _____ SFI (Sustainable Forestry Initiative Program)
(c) _____ PEFC (Programme for the Endorsement of Forest Certification Schemes)
(d) _____ Rainforest Alliance SmartWood Program
(e) _____ National certification scheme/standard. Please specify: _____
_____
(f) _____ Other certification schemes. Please specify: _____
_____

8. ARE YOUR FOREST MANAGEMENT AND TIMBER HARVESTING OPERATIONS SUBJECT TO OTHER STANDARDS OR PERFORMANCE MEASURES? Yes ____ No ____. If Yes, please describe: _____
_____
_____

9. ARE YOU FAMILIAR WITH THE CONCEPT OF CRITERIA AND INDICATORS FOR SUSTAINABLE FOREST MANAGEMENT? Yes____ No____. If yes, which C&I process(es) are you aware of (check all that apply):

(a) ____International Tropical Timber Organization (ITTO) criteria and indicators for the sustainable management of tropical forests (national and FMU levels) www.itto.int
(b) ____ITTO/African Timber Organization (ATO) principles, criteria and indicators for the sustainable management of African natural tropical forests (national and FMU levels) www.itto.int
(c) ____Tarapoto Process on criteria and indicators for sustainability of Amazonian forests (global, national and FMU levels) www.otca.info/portal/
(d) ____Forest Europe criteria and indicators (national level) www.foresteurope.org
(e) ____Montreal Process on criteria and indicators for the conservation and sustainable management of temperate and boreal forests (national level) www.mpci.org

10. FOR PRIVATE AND COMMUNITY FOREST MANAGERS/OPERATORS. DOES YOUR ORGANIZATION USE OR APPLY (OR HAS IT USED/APPLIED) ANY OF THE C&I LISTED IN ITEM 8 IN ORDER TO (check all that apply):

(a) ____Monitor and assess the state of forest management in your forest area/concession/FMU. Which C&I: _____
_____
(b) ____Report on the state of forest management in your forest area/concession/FMU. Which C&I: _____
_____
List of assessment reports prepared to date: _____
_____
_____
(c) ____ Other uses. Please explain: _____
_____
_____
(d) If you checked (a) (b) or (c), does your organization consider that the C&I framework used/applied remains a valuable and useful tool to assess, monitor and report on forest management at the field/FMU level? Yes ____ No ____ If No, please explain: _____
_____
_____

(e) If your organization is not using C&I as an assessment framework, please explain how you monitor, assess and report on the state of forest management in your forest area/concession/unit: _____
_____
_____

11. FOR CERTIFIERS. ARE YOUR CERTIFICATION PRINCIPLES OR STANDARDS BASED ON OR RELATED TO ANY OF THE C&I PROCESSES LISTED IN ITEM 8? Yes ____ No ____. If Yes, please explain: _____
_____
_____

(a) How many hectares of forest has your company certified? _____. What countries and/or regions? _____
_____

12. FOR ASSOCIATIONS: DO YOU REQUIRE YOUR MEMBERS TO MEET CERTAIN STANDARDS OR PERFORMANCE MEASURES IN THEIR FOREST MANAGEMENT AND TIMBER HARVESTING PRACTICES? Yes ____ No ____. If Yes, please explain and note if/ how the standards relate to C&I:_____
_____
_____
(a) How many and what type(s) of members do you have? _____
_____
(b) How many hectares of forest do your members together own or manage?_____

13. HAS YOUR ORGANIZATION RECEIVED TRAINING OR OTHER ASSISTANCE TO INCREASE ITS INTEREST AND CAPABILITY TO USE/APPLY C&I AT THE FIELD/FMU LEVEL TO MONITOR/ ASSESS AND REPORT ON FOREST MANAGEMENT PRACTICES? Yes____ No ____. (a) If Yes, please describe, including source of assistance_____
_____
_____
(b) If No, is your organization interested in receiving training or other assistance? Yes ____ No ____

14. PLEASE USE THE FOLLOWING SPACE TO PROVIDE ANY FURTHER RESPONSES TO THE ABOVE ITEMS OR FURTHER COMMENTS/INFORMATION REGARDING YOUR ORGANIZATION'S EXPERIENCE USING C&I:
_____
_____
_____
_____
_____

Annex 8
List of private/non-government survey recipients and respondents

1. Producers – Africa

COUNTRY	NAME & INSTITUTION	REPLY
1.A: Forest-sector companies		
Cameroon	Jérôme Laporte, Pallisco & CIFM	O
	Mark Diepstraten, Koninklijke Houthandel G. Wijma & Zonen B.V.	
	Sandra Razanamandranto, Wijma Cameroon S.A.	O
	Alberto Saviolo, ALPICAM	
	Antoine Darazi, Cameroon United Forests (CUF)	
	Salvatoreantonio Aulizio and Franco Scarabello, Ecam Placages S.A.	
	Bertin Tchikangwa, TRC	O
	Giorgio Coates, SEBAC S.A.	
	Freddy Decolvenaere, Société Forestière et Industrielle de la Lokoundjé S.A.	
Congo	Christian Schwarz, Congolaise Industrielle du Bois (CIB)	
	IFO (Danzer Group subsidiary in Cameroon)	
Gabon	Cora Wood Gabon (CWG)	
	Eric Chezeaux, Rougier Gabon/CIFHO	
	Jacqueline Van de Pol, Campagnie des Bois du Gabon (CBG)	
	Plysorol, Leroy Gabon	
Ghana	Ayum Forest Products (Naja David Group)	
	Ernest Apraku, Asua Bomosadu Timbers & Sawmills Ltd	
	Samuel Tseganu, John Bitar & Company Limited	O
	Justice Eshun, Samartex Timber and Plywood Company Limited	
	Mark Stordeur, Stordco International	
1.B: Associations and other organizations		
Cameroon	Mimbimi Esono Parfait, Cameroon Forest Certification Initiative	O
	Groupement de la Filiere Bois de CAMEROUN (GFBC)	
Gabon	Union des Forestiers Industriels et Amenagistes du GABON (UFIGA)	
Ghana	Ghana Timber Millers Organisation (GTMO)	
1.C: Regional associations and other organizations		
France	Hervé Bourguignon, Interafrican Forest Industries Association (IFIA)	
Kenya	Godwin Kowero, Africa Forest Forum (AFF)	
	Maarten Wijma, Wijma Group	
	Abdon Awono, CIFOR	
	Joe R. Cobbinah, PROTA (Plant Resources of Tropical Africa) Foundation	

2. Producers – Asia-Pacific

COUNTRY	NAME & INSTITUTION	REPLY
2.A: Forest-sector companies		
Indonesia	Chris Jeon, Hyundai Merchant Marine Co., Ltd	
	Kusmanto Wirianata, PT. Tanjung Selatan	
	Buniadi Makmur, PT. Kayu Lapis	
	I.Y. Choi, STX Pan Ocean Co. Ltd.	
Malaysia	Kai Min Lin and Karen Lin Kai Wen, Cymao Plywood Sdn. Bhd.	
	Jonas Israel, McCorry & Co Limited	
	Chen Yung Pin, Zenova (M) Sdn, Bhd.	
	Hii Sii Yew, Jaya Tiasa Timber Products	O
	Marianne Cheng, Ta Ann Holdings Bhd (Sarawak)	
	Pauline Wong, Ta Ann Holdings Bhd (Sarawak)	
	Marco Poot, Lionex (m) Sdn. Bhd	
	Stephen Lau Lee Kiong, KTS Holdings SDN BHD.	
	Ling Wang Sing, Segereka Sdn Bhd	
	Nik Nasrul Hakimi, Gold Class Oudh Sdn Bhd	
	Neil Wong Hou Liang, WTK Realty Sdh Bhd	
	Rimbunan Hijau Sdh Bhd	
	Michael Mu Chung Jung, Shin Yang Sdh Bhd	
Philippines	Aristeo G Puyat, Surigao Development Corporation	
	Leo Rodil, CSCD Casilayan Softwood Development Corp.	
Thailand	2BNS Wood Industry Co. Ltd.	
2.B: Associations and other organizations		
Indonesia		
	Indonesian Ecolabeling Institute	
	Indonesian Wood Panel Association (APKINDO)	
	Njoto Suharfjojo, Forest Industry Revitalization Body (BRIK)	
	Nanang Roffandi Ahmad, Association of Indonesian Forest Concession Holders	
	Indonesia Sawmill & Wood Working Association (ISWA)	
Malaysia		
	Annie Ting, STA (Informal response)	O
	Sarudu Hoklai, Sarawak Timber Industry Development Corporation (STIDC)	
	Noraihan Abdul Rahman, Malaysian Timber Council (MTC)	
	Ruzainah Abdul Jalil, Malaysian Timber Industry Board	
	Sabah Timber Industries Association (STIA)	
Papua New Guinea	Yati Bun, FPCD	O
	Ron Wilson, Papua New Guinea Forest Industries Association Inc	
Philippines	Maila R Vasquez, Philippine Wood Producers Association	
2.C: Regional associations and other organizations		
Japan	Haruyoshi Takeuchi, PEFC Asia Promotions	
Malaysia	Aimi Lee Abdullah, European Forest Institute	
	Chen Hin Keong, Traffic International	
Nepal	Robert Zomer, International Centre for Integrated Mountain Development (ICIMOD)	
Thailand	Toon de Bruyn, RECOFTC - The Center for People and Forests	

3. Producers – Latin America

COUNTRY	NAME & INSTITUTION	REPLY
3.A: Forest-sector companies		
Bolivia	Guilhermo Roig Justinino, AMBORÓ LUMBER COMPANY	
	Steve Reister, SLV- Southern Lumber and Veneer	
	Alfredo Abuawad A., Aserradero San Martin S.R.L.	
	Oscar Farfán Mealla, Tahuamanu S.A.	
	Janeth Arcani, Sumapacha Industrial S.A.	
	José Ariel Schwartz Urbach, Schwartz Vrena S.R.L	
	Luis Mayser Ardaya, Fobol Ltda. Forest Bolivian	
	Felix Martinez, Martinez Ultra Tech Doors Ltda.	
	Nicolás Altmann Croizer, MADERAS DEL SIGLO XXI	
	Sandro Giordano, Bolital Ltda. Empresa Forestal y Agricola	
	Fernando Antelo Parra, La Chonta Woods Ltda.	O
	Segismundo Jorge Braun Bodonitz, Surimex	
	José Eduardo Paz Ortiz, San Pedro TecnoCarpintería S.R.L.	
	Alejandro Antelo Parra, Sobolma	
	Rocco Colanzi Di Biase, Industria Forestal	
	Mauricio Querejazu C., Exotic Woods	O
	Pablo Antelo, Agroindustrial El Cedro	O
Brazil	Paulo Cavalcanti Neto, Somapar Soc. Mad. Paranaense Ltda	
	Isac Chami Zugman, Compensados e Laminados Lavrasul S.A.	
	Douglas Antônio Granemann de Souza, Triângulo Pisos e Painéis Ltda	
	João Carlos Baldasso, Guavirá Industrial e Agroflorestal Ltda	O
	Luis Fernando Honório Alves Jr, E.Carli. Representações Ltda	
	Silvano D´Agnoluzzo, Rio Concrem Industrial Ltda	
	AGRO INDUSTRIAL DE MADEIRAS VALE FÉRTIL LTDA	
	ALMEIRIM INDUSTRIAL LTDA	
	ARCA INDÚSTRIA E AGROPECUÁRIA LTDA	
	CIKEL BRASIL VERDE S/A	
	EBATA – PRODUTOS FLORESTAIS LTDA	
	GLOBAL IND. COM. E NAVEGAÇÃO LTDA	
	JURUÁ FLORESTAL LTDA	
	ORSA FLORESTAL S/A	
	RONDOBEL MADEIRAS LTDA	
	SEMASA – INDUSTRIA COMERCIO E EXPORTAÇÃO DE MADEIRAS LTDA	
	Daniel Berneck, BERNECK S/A PAINÉIS E SERRADOS	
	Rafael Andrade Festugatto and Maria E. A. Festugatto, BRASPLAC INDUSTRIAL MADEIREIRA LTDA	
	Moacir Alberto Raimam, CENTERPLAC COMPENSADOS LTDA	
	Renato Uliana, COMPENSADOS ULIANA LTDA	
	Adriano D'Agnoluzzo, FLORAPLAC INDUSTRIAL LTDA	
	Hildefonso De Abreu Araújo, HIDIL PLAC INDÚSTRIA E COMÉRCIO LTDA	
	José Arnaldo Bertola Uliana, INDÚSTRIA MADEIREIRA ULIANA LTDA.	
	Luiz Carlos Jardim, LANO DA AMAZÔNIA LTDA	
	Nelson Thomasi, MADEIREIRA THOMASI S.A	
	Fábio A. Marchetti, MANOEL MARCHETTI INDÚSTRIA E COMÉRCIO LTDA	

Brazil (cont'd)	Joares Antônio Santin, MASEAL INDÚSTRIA DE COMPENSADOS LTDA	
	Cláudio A. Zini, PORMADE-PORTAS DE MADEIRAS DECORATIVAS LTDA	
	Carlos Bianchi, ARAUCO FOREST BRASIL S/A	
	Aldo Ezidio, RIGESA, CELULOSE, PAPEL E EMBALAGENS LTDA - DIVISÃO FLORESTAL	
	Salo D. Seibel, DURATEX S.A.	
	Carlos Alberto de Oliveira Roxo, FIBRIA	
	Gilberto Schille, Triunfo Amazonia	
	Paula Lague, IPA Wood Flooring	
	John McGlocklin, Nova USA Wood Products LLC.	
Colombia	Alfonso Ocampo, PROPAL- Produtora de Papeles S.A.	
Ecuador	Manoel Durini, Endesa Botrosa	
	Otto Suárez R., Fundación Wong	
	Adriana Izquierdo de Salazar, INMAIA S.A.	
	Felipe Pazmiño, Aglomerados Cotopaxi	O
Guatemala	Roberto Rios, Mega Maderas S.A	
Guyana	Iwokrama International Centre for Rain Forest Conservation and Development	
Honduras	Amnon Ronen, Galiltec S.A.	
Mexico	Kristina Diaz Paterson, Proteak Renewable Forestry	O
Panama	Ingryd Taracena, Holz International	
Peru	Drago Bozobich, Bozovich Group	
	Henry Bolarin, Maderera Vulcano	
	Miguel Ubilluz, Peruvian Amazon Line	
Suriname	Stichting voor Bosbeheer en Bostoezicht (SBB)	
3.B: Associations and other organizations		
Bolivia	Jorge Avila, CAMARA FORESTAL DE BOLIVIA (CFB)	O
Brazil	Alvaro Leite, CIPEM	O
	Jeziel A. de Oliveira, ABIMCI	
	Guilherme Carvalho, AIMEX	O
	Maria Teresa R.Rezende, CERFLOR- INMETRO	O
	Cesar A. dos Reis, ABRAF- Associação Brasileira de Produtores de Florestas Plantadas	
	Ariel de Andrade, ANPM- Associação Nacional dos Produtores de Pisos de Madeira	
	Carlos Aragon, GTZ	
Ecuador	Pablo Noboa, ASOTECA- Asociación Ecuatoriana de Productores de Teca y Maderas Tropicales	
	Juan Carlos Palacios Burneo, COMAFORS	
	Asociación Ecuatoriana de Industriales de la Madera (AIMA)	
Guatemala	José Román Carrera, Rainforest Alliance	
Guyana	Khalawan, Forest Products Association of Guyana	
	Derrick Cummings, Forest Products Development and Marketing Council of Guyana	
Honduras	Carlos H. Sandoval, Rainforest Alliance	
Mexico	Antonio Manuel Garcuia Gomzales, La Confederación Nacional de Organizaciones de Silvicultores (CONOSIL)	
	Comunidad Indígena de Nuevo San Juan Parangaricutiro	
Peru	Manuel Portugal Velarde, Asociación de Exportadores (ADEX)	
	Erik Fischer, Confederación Peruana de la Madera	
	Ricardo Campins, Corporación Andina de Fomento (CAF)	
Venezuela	Alfredo Solarte Lindo, Corporación Andina de Fomento (CAF)	

3.C: Regional associations and other organisations		
Ecuador	Hans Thiel, ACTO	

4. Consumers

COUNTRY	NAME & INSTITUTION	REPLY
4.A: Forest-sector companies		
Australia	Simon Cook, GUNNS Limited	
	Vince Erasmus, Elders Forestry Limited	
	Mark McRostie, Timberlands Pacific PTY LTD	
	Dave Barbour, Forestry Plantations Queensland PTY LTD	O
Belgium	Sappi Europe SA	
Canada	Mike Maxfield, AbitibiBowater – Ontario Woodlands	
	Ray LeBlanc, A.T. Limited Partnership	
	Ryan Clark, Capacity Forest Management Ltd	
	Andrew Elliot, Fornebu Lumber Company, Inc. – New Brunswick	
	Interfor	
	Millar Western Forest Products Ltd	
	Andrea Doucette, NewPage Corporation – Port Hawkesbury	
	Dave Watt, Sinclair Group Forest Products	
	Stephen Vinnedge, West Frazier Mills, Ltd	
	Jim Stark, Weyerhaeuser Company - Vancouver	
China	Sonia Chiang, Robinson Lumber Company	
	Martin, Mak Chun Tung, Interwood International Limited	
	Gary Yu, Yenling Door&Window Industries Co. Ltd	
	Dongsheng Tan, China Forest Industry Group	
Finland	Petteri Seppänen, Dasos Capital	
	Ari-Pekka Heikkila, Metsaliitto Group/Metsaliitta Cooperative	
	Stora Enso Wood Supply	
France	Olivier Jancovici, Centre Bois Massif	
	Christian Bedouet, Christian Bedouet Scierie	
	Roland Bedouet, Roland Bedouet Sarl	
	Scierie du Gros Chene	
	Tarteret Philippe Sa	
Germany	Dietmar Tombers and Markus Tombers, Tombers-Hartholz GmbH	
	Michael Decker, Decker Holz GmbH	
	Philipp Bahnmuller, Bavarian State Forest Enterprise (Bayerische Staasforsten)	
	Hessian State Forest Company (Hessen-Forst Landesbetriebsleitung)	
	Joerg Vanderheide, Hessian State Forest Company (Hessen-Forst Landesbetriebsleitung)	
Italy	Enrico Calvo, Ente Regionale per I Servizi all'Agricoltura e alle Foreste (ERSAF)	
New Zealand	Asia Pacific Forest Resources	
Norway	Ingemar Eggen, Glommen Skog BA	
	Erling Bergsaker, Norsk Skogsertifisering AS	
	Torkel Vindegg, SB Skog	
	Bernt Magne, Viken Skog BA	
Netherlands	Mark Diepstraten, Koninklijke Houthandel G. Wijma & Zonen B.V. (See Cameroon forest companies)	O
Portugal	Grupo Portucel Soporcel	

Republic of Korea	N.J. Huh, Joo Hae Forest Products Co.	
	Youngju Park, Eagon Industrial Co. Ltd.	
Sweden	Borje Pettersson, Bergvik Skog AB	
	Anders Forsgren, Boliden Mineral AB	
	Hanna Triumf, Holmen Skog AB	
	Bengt Brunberg, Korsnas AB Skog	
	Jonas Eriksson, Norra Skogsagarna	
	Per Sandberg, Skogagarna Mellanskog ek	
	Johan Bjernulf, Stora Enso Stog AB – Sweden	
Switzerland	Dominique Mantese, Berner Waldbesitzer BWB	
	Theo Kern, Gruppe AWV	
UK	Tanya Patterson, Mondi	
	Northwood Forest Products International Ltd	
	Garry MacInnes, Scottish Woodlands Ltd	
	Douglas Hyslop, Scottish Woodlands Ltd	
	Simon Hart, UPM Tilhill	
USA	American Forest Management Group (AFM)	
	Brian Gowin, Crown Pine Parent L.P. c/o The Campbell Group	
	Brian Kernohan, Forest Capital Partners, LLC	
	Tom Trembath, Forest Investment Associates	
	Bruce C. McKnight, Hancock Natural Resource Group	
	Julie, Hancock Natural Resource Group	
	Joseph Lawson, MeadWestvaco (MWV)	
	Randy Taylor, Plum Creek Timber Company, Inc	
	Robert Hagler, RMK Timberland Group	
	Rayonier, Inc.	
	Ben Cazell, Rayonier – Western Forest Resources	
	Gary Boyd, Resource Management Service (RMS), LLC.	
	Mark Pawlicki, Sierra Pacific Industries	
	Gordon Gamble, Wagner Forest Management, Ltd	
	Rob Harder, Weyerhaeuser Company Limited	
	Bryan Hulka, Weyerhaeuser Company and Weyerhaeuser NR Company – Arkansas	
4.B: Associations and other organizations		
Australia	Warwik Ragg, Australian Forest Growers	
	Australian Forest Certification Scheme (AFCS)	O
Belgium	Tom Anthonis, SRFB	
Canada	Peter de Marsh, Canadian Federation of Woodlot Owners	
	Canadian Wood Council (CWC)	
	Kevin Fane Bollefer, Revelstoke Community Forest	
China	Xu Fang, AF&PA	
	Zhao Wei, China Paper Association	
	Shengfu Wu, China National Forest Products Industry	
Denmark	Tanjan Blindbaek Olsen, Danish Forest Association	O
	Jan Sondergaard, Denmark Forest Association	

Finland	Antti Sahi, MTK -Central Union of Agriculture Producers and Forest Owners	
	Finnish Forest Industries Association	
	Jukka Hujala, Forest Owners Association of Lake-Finland	
	Kai Lintunen, Finnish Forest Association	
France	Henri Plauche-Gillon, Forestiers Prives de France	
Germany	Sabrine Bresemann, AGDW	
Ireland	Donal Whelan, Irish Timber Growers Association	
Japan	Sustainable Green Ecosystem Council	
	Japan Federation of Wood-Industry Associations (JFWIA)	
New Zealand	George Asher, Lake Taupo Forest Trust	
	John Dermer, New Zealand Farm Forestry Association	
	Glen Mackie, New Zealand Forest Owners Association	
	Andrew McEwen, New Zealand Institute of Forestry	
	Lawrie Halkett, New Zealand Pine Manufacturers Association	
	New Zealand Timber Industry Federation	
	Daniel Miles, Wood Processors Association of New Zealand	
Norway	Gudbrand Kvaal, Norges Skogeierforbund	
Poland	Jan Kubiak, The Polish Association of Forest Entrepreneurs and Companies	
Portugal	FORESTIS - Portugal Forest Association	
	Henk Feith, Silvicaima, Sociedade Silvicola Caima	
Spain	Garcia Fernando Molina, COSE	
	Agrela Patricia Gomez, COSE	
Sweden	Marten Larssen, Swedish Forest Industries Association	
	Linda Hedlund, LRF Skogsagarna- Federation of Swedish Farmers	
	Johanna Fintling, LRF Skogsagarna- Federation of Swedish Farmers	
	Lennart Ackzell, Federation of Swedish Forest Owners	
Switzerland	Amstutz Urs, Waldwirtschaft Schweiz (WVS)	
UK	Fiona Angler, CONFOR- Confederation of Forest Industries	
	Scottish Forest and Timber Technologies (SFTT)	
USA	Jeffrey Bradley, AF&PA	
	Forest Landowners Association (FLA)	
	Dave Tenny, NAFO-National Alliance of Forest Owners	
	Helen Colosimo, NAFO-National Alliance of Forest Owners	
	Bob Simpson, American Forest Foundation	
	American Wood Council	
	Keith Argow and Darrel Pendris, NWOA- National Woodland Owners Association	
	Steve Andringa, Yakama Nation	
4.C: Regional associations and other organizations		
Europe	Marta Gaworska, Confederation of European Forest Owners (CEPF)	
	Bernard de Galembert, Confederation of European Paper Industries (CEPI)	
	Ulrich Leberle, Confederation of European Paper Industries (CEPI)	
	Noura Younes, Confederation of European Paper Industries (CEPI)	
	CEI-Bois - Confederation of European Woodworking Industries	
	Inazio Martinez de Arano, L'Union des Silviculteurs de Sud de l'Europe (USSE)	
	Christian Pinaudeau , L'Union des Silviculteurs de Sud de l'Europe (USSE)	
	Nella Mikkola, COPA-COGECA (European Farmers and Agri-cooperatives)	

North America	Bob Simpson, American Tree Farm System	
	Allison Welde, SFI	O

5. Non-ITTO countries

COUNTRY	NAME & INSTITUTION	REPLY
5.A: Forest-sector companies		
Argentina	Jose Urtubey, Celulosa Argentina	
Mozambique	Jacinto Mutemba, Rural Consult Lda.	
	Graeme White, Dalmann Hardwood Furniture	
Russia	George Krapvine, Woodbridge International Ltd.	
5.B: Associations and other organizations		
Chile	Fernando Raga, CORMA	
Czech Republic	Josef Barton, SVOL	
Estonia	Ants Varblane, Estonian Private Forest Union	
Latvia	Arnis Muiznieks, Latvian Forest Owners Association	
Lithuania	Gaizutiz Algis, Forest Owners Association of Lithuania	
Mozambique	Mozambique Institute of Export Promotion (IPEX)	

6. International associations and other organizations

COUNTRY	NAME & INSTITUTION	REPLY
France	Herve Bourguignon, Association Technique Internationale des Bois Tropicaux (ATIBT)	
Germany	Andre de Freitas, FSC	
Indonesia	Markku Kanninen, CIFOR	
Nepal	Ghan Shyam Pandey, GACF	
Norway	Ivar Legallais-Korsbakken, IFFA	O
Switzerland	James Griffiths, World Business Council on Sustainable Development	
Switzerland	ECE Timber Committee	
Switzerland	Caroline Stein, PEFC	
USA	International Wood Products Association (IWPA)	
USA	Rainforest Alliance SmartWood Program	
USA	Bob Johnston, TFF	
USA	Linda Sandler, The Forest Foundation	
USA	Peter A. Neame, International Finance Corporation (IFC)	

INTERNATIONAL TROPICAL TIMBER ORGANIZATION
International Organizations Center, 5th Floor, Pacifico-Yokohama, 1-1-1, Minato-Mirai, Nishi-ku, Yokohama, 220-0012, Japan
Tel 81-45-223-1110 Fax 81-45-223-1111 Email itto@itto.int Web www.itto.int