

Canada's Experience in Applying C&I to Measure Progress Towards SFM—Perspectives from the National, Regional and Local Levels.

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Introduction

This paper will provide perspectives of Canada's experiences in applying Criteria and Indicators (C&I) to measure progress towards Sustainable Forest Management (SFM) at the National, Regional (Provincial) and local levels. SFM is rooted in Bruntland's concept of Sustainable Development and is about providing for present forest-based needs without compromising future options.

Canada: A Forest Nation

Canada's forests are essential to the long-term well being of Canada's communities, economy, and environment. Almost half of Canada's land base is forested - representing 10 percent of the global forest. Recently released information from Canada's Forest Inventory 2001 indicates that there are 401.5 million hectares of forest and other wooded lands in Canada. About 143 million hectares of forestland are considered to be accessible and most likely to be subject to forest management activities. Harvesting takes place on about 1 million hectares each year. Most of the forest (93 percent) is publicly owned, the rest is on the private property of over 425,000 land-owners. Over 300 communities are directly dependent on the economic use of the forest resource, and their work supports Canada's 20 percent share in global forest trade of forest products. In recent years Canada's annual positive balance of trade in forest products has been over \$30 billion. In 1999 wages for the forest sector amounted to \$12 billion. All this activity in turn brings domestic and international attention to our forest management choices and the implications of those choices on the condition of local and global environmental conditions and the social and economic circumstance over time.

Canada recognizes the multitude of forest benefits it enjoys as well as its role as steward of 10 percent of the world's forests. Canada accepts its responsibility to maintain its forests in a vital state and to manage them in a sustainable manner. But, pressures on the forest are increasing; demands for increased access to the forest for timber extraction to meet the needs of international markets are often seen to be in conflict with the values of other forest users.

Canada's Commitment to SFM

Canada and the international community recognized the importance of SFM and the need for indicators in 1992 at the United Nations Conference on Environment and Development (UNCED) with the adoption of a Statement of Forest Principles. The concept was embodied in Chapter 11 of the conference's action plan, Agenda 21 and countries around the world began to demonstrate their commitment on the ground.

Canadians are demanding more information, more options, more involvement in decision-making, and more equitable sharing of benefits, and the marketplace seeks assurances that forest management in Canada is sustainable. To meet these challenges, managers and decision makers need tools to demonstrate progress toward sustainable forest management (SFM).

Criteria and Indicators (C&I) is one such tool. C&I provide a science-based framework to define and measure Canada's progress in the sustainable management of its forests. Criteria represent forest values that society wants to enhance or sustain, while the indicators identify scientific factors to assess the state of the forests and measure progress over time. The C&I enable a common understanding of what is meant by SFM. Collectively, they provide a framework for reporting on the state of

forests, forest management, and achievements in SFM, by identifying those elements of the forest ecosystems, and related social and economic systems that should be sustained or enhanced.

Canada's Political Structure with Respect to Forest Management

To better understand Canada's experience with C&I at the national to local levels it is helpful (if not essential) to be aware of Canada's political structure and the various roles and responsibilities of each level of government with respect to forests. Canada is a federation of 10 Provinces and 3 Territories in which the Provinces and Territories have jurisdiction over forest on provincial and territorial crown land. Each Province and Territory has its own set of statutes, policies and regulations to govern the management of its forests. A broad spectrum of users – the public, forest industries, Aboriginal groups and environmental organizations – are often consulted to ensure that recreational, cultural, wildlife and economic values are incorporated into forest management planning and decision making. The federal government's role in forestry pertains to such areas as research, trade and commerce, international affairs, the environment, pesticide regulation, training and Aboriginal Affairs and the management of federally owned lands.

The Canadian Council of Forest Ministers (CCFM)

There has been a long tradition of cooperation between the federal and provincial governments in forestry matters. The creation of the Canadian Council of Forest Ministers (CCFM) in 1985 has provided an important forum for the federal, provincial and territorial governments responsible for forests to work cooperatively to address major areas of common interest. The CCFM provides leadership on national and international issues such as C&I for SFM and sets direction for the stewardship and sustainable management of Canada's forests.

Canada's National Forest Strategy (NFS)

The CCFM initiated Canada's National Forest Strategy (NFS) to establish the vision and goals for Canada's forests. In recognizing the complexity of SFM, each NFS is a product of an iterative process that involves many Canadians representing a broad diversity

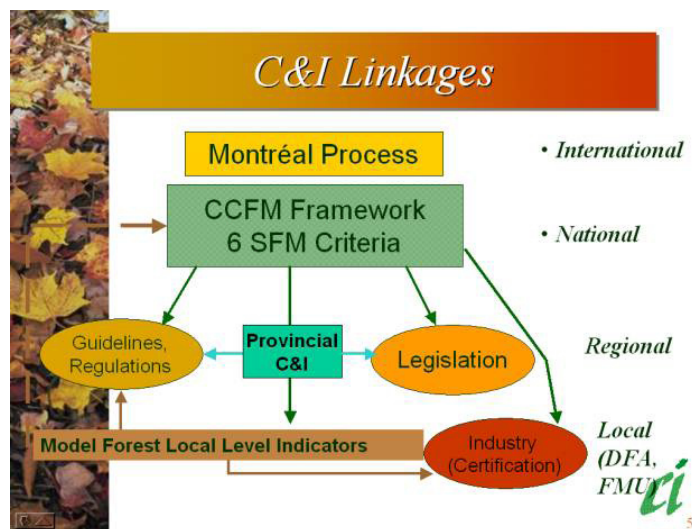


Figure 1. Canada's Criteria and Indicators Linkages.

of backgrounds, interests, and expertise and forest values to describe Canada's commitment to SFM. These values and commitment to SFM are enshrined in the 1992, 1997 and 2003 National Forest Strategies. One of the commitments of the NFS is to develop and use C&I framework for SFM. Canada's approach to the development of C&I is based on collaboration internationally through its involvement with the Montréal Process and nationally through the CCFM.

Linkages: International to Local

Canada recognized at an early stage that the successful development and implementation of C&I would depend on the establishment and maintenance of strong linkages among those responsible for international, national, provincial and local perspectives. In figure 1, the linkages among the various levels of organizations involved in Canada's C&I for SFM are mapped. The international, national, regional (or Provincial) and local levels are linked and this paper will outline examples of how the national C&I are woven into the network of Canada's SFM activities.

National Use of C&I

For the purposes of this paper, the linkages at the national level (fig. 1) can best be organized under two general themes; either Canada's C&I linkages to National and International Reporting or Canada's C&I linkages to Policy fora.

Reporting National Progress toward SFM

CCFM & National C&I Reporting

The release of the Canadian Council of Forest Ministers (CCFM) Framework of C&I for SFM in 1995, and subsequent reports in 1997 and 2000, were important steps in implementing Canada's commitments in the national forest strategies, as well as the forestry commitments made at UNCED. In 2003, after broad public consultation, the CCFM released its revised C&I framework of 6 criteria and 46 indicators. The CCFM have agreed to produce their next C&I report in 2005. The sharing of information and resources between jurisdictions and stakeholders also helps to build capacity and reduce reporting costs. The CCFM C&I also provide a framework for standardizing national forest data collection and the framework has been used to guide national research planning.

The CFS is now engaged with its CCFM partners to prepare and produce the next C&I report for release in September 2005. This report will provide information on Canada's forests to domestic and international audiences to help demonstrate Canada's progress in SFM. The report will also contribute to Canada's commitments in the 2003 National Forest Strategy to establish better capacity for credible and authoritative reporting on C&I. Report preparation and production will engage staff from across the CFS, other federal departments and agencies, and provincial and territorial forest management agencies. The 2005 report will provide the public and decision makers with more information, increasing the range of options available for using the forest resource and hopefully leading to more involvement in decision-making by the public and a more equitable sharing of benefits.

Montréal Process and National C&I Reporting

With UNCED, the potential impact of global perspectives on local decision making for SFM was clearly understood by Canada. Canada joined the Working Group on C&I for the Conservation and Sustainable Management of the Temperate and Boreal Forests (est. June 1994). This working group, known widely as the Montréal Process (MP), is made up of 11 other countries that together represent 90 percent of the world's boreal and temperate forests. These countries agreed to work together to develop a common suite of measures (C&I) to use in reporting national progress to SFM. Canada is committed to the MP and collects a considerable amount of data and information to support the indicators through

the CCFM. The C&I of the MP and the CCFM show considerable alignment in the values each has identified as important to measure progress toward SFM. This compatibility consequently allows Canada to report its national progress towards SFM using the CCFM C&I framework. Canada's C&I framework was released in 1995 and national reports were produced in 1997 and 2000.

In September 2003, the MP member countries reaffirmed their commitment to implement the MP C&I and agreed to review and revise the MP C&I. Membership in the MP is part of Canada's overall commitment to promote SFM. The Montréal Process provides an international forum for collaboration, including catalyzing similar national efforts and promoting a shared view about what constitutes SFM and how to measure it. The exchange of information and experience has enabled the member countries to identify common goals for action, consolidate technical know-how related to indicator measurement and data collection, foster bilateral and regional cooperation among members and enhance national capacity to report on SFM.

National Coordination of Data Collection and Management

The CCFM recently adopted an operating framework for better management of its activities. The core business of CCFM is to stimulate the development of policies and initiatives for the promotion of sustainable forest management in Canada. The activities of the CCFM are organized around five Strategic Directions: International Issues, Sustainable Forestry, Information and Knowledge, Science and Technology, and Forest Communities. The National Forest Information System (NFIS) and the National Forestry Database Program (NFDP) have aided the CCFM in its goal to accomplish a national and international forest information strategy. Specifically, the NFDP has established a comprehensive national forestry database to develop a public information program and to provide forestry information to the federal, provincial and territorial policy processes, while NFIS has built on existing databases and extensions to those databases to meet Canada's provincial, national and international reporting requirements on forest sustainability. Responsibility for reporting on the CCFM C&I now clearly rests with the NFDP. The new operating framework permits and promotes enhanced coordination of the various national information and knowledge initiatives. The challenge now is to ensure that these initiatives continue to work closely together to acquire the necessary forest information and

establish the systems to better collect, manage, and provide Canadians with more ready and access to the data relevant to national C&I.

Consolidating Reporting to National and International Efforts Using C&I

Canada was the first MP member country to attempt to fully report using its national C&I, and was the first to complete a review of its national C&I framework. Exploring options to consolidate reporting on various initiatives and to various fora is a national action item outlined in the 2003 NFS. Canada already uses information gathered for the CCFM C&I to report on the MP C&I. Now options are being explored to consolidate reporting on other initiatives and fora. This includes looking at whether the national C&I can be used to report on the United Nations Forum on Forests (UNFF) Proposals for action (Pfa), the United Nations Convention on Biological Diversity (CBD) program of work, the Global Forest Resource Assessment (FRA) and the NFS commitments for action.

National Links to Other Federal Government Indicator Reporting Initiatives

As part of its efforts to consolidate reporting and be the authoritative source of national information on the forest sector, the CFS also participates and contributes to indicator initiatives led by other federal departments that are seeking to develop and report on indicators of sustainable development. Currently, CFS is engaged in the development of social and economic indicators of sustainable resource-based community development. The CFS is also engaged in initiatives lead by other federal departments seeking to develop and report on forestry indicators. Environment Canada has initiated a process to develop the Canadian Biodiversity Index (CBI) to assess the status of biodiversity in all of Canada's ecosystems. The proposed use of this index is to report on Canada's progress towards targets agreed to by the Convention on Biodiversity (CBD). The CFS has been involved in developing the draft framework to ensure links with existing forest biodiversity indicators. In addition, the National Roundtable on the Environment and the Economy's (NRTEE) Environmental Sustainable Development Indicators Initiative recently developed a set of indicators to report on Canada's natural capital that includes an indicator on forests. The CFS wants to

ensure that the best available data on forests are used and reduce duplication of data collection.

Using C&I to Guide National Level Research

The C&I are being used to help guide national level research in Canada related to SFM. Recently, the CFS has begun research on public satisfaction in forest management practices and defining forest-dependent communities in direct response to knowledge gaps identified through the C&I process. Also, Canada's Sustainable Forest Management Network (SFMN), a part of Canada's Network of Centers of Excellence (NCE) established in 1995, supports university-based research and innovation that is relevant and necessary to sustain Canada's forests and forestry-dependent communities. The SFMN refers to the CCFM C&I framework as one tool in identifying SFM research needs.

C&I Reports Contribute to National Policy and Decision-making

International Trade

International competition in forest products is strong, forestland use pressures are increasing, and there are uncertain impacts on Canada's forests due to climate change. Within this context, C&I reports provide an effective tool for government to provide the international audience with a clearer insight into the positive impact the many changes made in Canada's forest sector have had on SFM and thereby contribute to strengthening Canada's SFM image in the market place.

Federal Social Agenda

While pressure on the forest resource is increasing, Canadians also want a vibrant 21st century economy and they see forestry as an important part of that economy. The government has committed to enhancing rural development by finding opportunities to add greater value to natural resources. The government also wants to reduce the economic gap between Aboriginal and non-Aboriginal communities. This means better economic opportunities for Aboriginals in communities, a higher quality of life, more economic self-reliance and better education and work-force skills. Since about 80 percent of Aboriginal communities are located in forests, the forest sector should be an integral part of achieving

these goals. Canada's national C&I framework features a number of indicators directly related to these goals which may offer a tool to assist in determining progress toward these goals to better guide policy decisions.

Sub-National Use of C&I

Provincial and Territorial Use of C&I

In Canada, forest management responsibilities rest, for the large part, with the Provincial and Territorial governments. These jurisdictions clearly express their collective support to the national CCFM C&I process and to the National Forest Strategy. Guided by these national frameworks, each Province and Territory continues to create ways to improve their on-going support to their national level C&I commitments. Each jurisdiction is also responsible to determine how best to integrate and link C&I into their own management responsibilities to meet their particular circumstances and needs. In the following summary of the benefits being accrued by each provincial and territorial government to its forest management and accountability, responsibilities are evident as the linkages to C&I increase. These benefits include better evaluation of policies and regulations, increased capacity and reduced reporting costs, more meaningful public input into planning and improved forest practices towards SFM. Each province and territory is involved in the national C&I through the CCFM and with local level issues through their forest management planning processes and, where applicable, with their model forest(s). The provinces and territories dedicate expertise and resources to support national task forces for the development, reporting and data collection and management for C&I.

From the results of an ad hoc, informal survey conducted by the authors of provincial C&I contacts, most provinces and territories have, in their own way, begun to incorporate C&I into the sustainable management of their forests. Four provinces now have legislation or provincial strategies that require the use of indicators in assessing progress toward SFM. In some cases the legislation or strategies are explicitly linked to the CCFM C&I framework, using the criteria to help define SFM provincially or to help identify important strategic directions and values to which indicators should relate. In at least one case, a province has developed a resource evaluation policy to support its legislation, which outlines a provincial framework of C&I based on the CCFM C&I.

Reporting on progress is often done at both the provincial level and the Forest Management Unit (FMU) level. At the provincial level, at least five provinces have produced, or are committed to producing, a State of the

Forest report. These reports can take various forms, ranging from complete C&I reports using a provincial C&I framework to more general indicator reports addressing issues of concern to the province or assessing the sustainability performance of all tenure holders. In addition, at least one province is producing an overall sustainability report that will include indicators on forestry in addition to indicators addressing other natural resources. Whatever the format the reports have taken, in many cases, the indicators used in the provincial level reports are developed using the CCFM C&I as a starting point. In addition, attempts have been made to more strongly link the provincial indicators to either management actions that the province, as owner of the forest, can undertake or to stated desired forest conditions.

At the Forest Management Unit (FMU) level, at least five provinces and territories have developed or are developing Forest Management Planning Manuals (FMPM) that will use indicators to assess progress toward goals and objectives. In most cases, the CCFM criteria are included in the FMPM and in many cases the FMPM requires indicators that explicitly address the six CCFM criteria. In other cases, the CCFM C&I are used as a starting point for developing indicators at the FMU level.

In addition to this, some FMUs have taken actions to better incorporate indicators into their planning processes above and beyond the provincial requirements. Some tenure holders have incorporated C&I based on the CCFM C&I into their planning process even though the provincial regulations do not require it. Others are pursuing certification of their forest products using the CSA certification, which uses the CCFM criteria. There are also examples of companies including their Local Level Indicator reports, which they have developed through their involvement with a Model Forest, as part of their report on operations to the provincial government. The work of the Model Forests will be discussed in more detail in the following section.

Local Level Indicators and Industry Certification

Achieving national goals of sustainability largely rests on actions carried out at the local or forest management unit (FMU) level. As the forestry paradigm changed from sustained yield to sustainable use, the desire to engage local stakeholders in forest management planning grew.

At the local level, the CFS is the founder and the primary supporter of Canada's Model Forest Program. The Model Forest Program is currently approaching the mid-point of its third five-year phase. The Model Forest Secretariat, led by the Canadian Forest Service, ensures

that the model forests work as an effective network, sharing information, experience and best practices. The Secretariat has coordinators in Ottawa and regional representatives who are responsible for liaison with the various sites. Through the Secretariat, model forests benefit from joint strategic planning that supports local and regional leadership.

Local Level Indicators (LLI) were established as a strategic project of the Model Forest Network in Phase II (1998 to 2002) of the Model Forest Program to engage local stakeholders to identify their values and develop, test and validate indicators to show progress toward SFM. The Canadian Model Forest Network (CMFN) has since developed a number of users' guides, workshops and databases to increase the use of LLI. LLI have also influenced some forest certification schemes, which are market-driven initiatives to demonstrate that a local forestry operation is sustainable. Most LLI and the Canadian Standards Association certification system are based on the national CCFM C&I. Included in the objectives of the current phase of the Program (2002-2007) is to increase the development and adoption of SFM tools within and beyond model forest boundaries, disseminate knowledge gained, strengthen network activities, and increase local-level participation in SFM. (In addition the CMFN supports the efforts of the International Model Forest Network in developing indicators for international Model Forests).

Results of a recent ad hoc, informal survey conducted by the authors are reported below providing examples of the benefits that are being realized through the development of LLI by Canada's Model Forests. These examples highlight the value LLI has brought to the local level challenge of measuring progress towards SFM.

It was decided among the partners of the Manitoba Model Forest (MBMF) that the responsibility for continued monitoring and reporting of LLI would lie with partners having management authority or those having "more permanency". The major industrial forest partner with MBMF is Tembec Incorporated. This company has embraced the LLI process on a number of fronts. C&I are part of their annual operations plans and reports and are linked to their ISO system currently in place and are being incorporated into the development of their FSC certification expected within the coming year. A number of indicators impact directly on the company's forestry practices on their operations and are used to develop forest management plans. For example, in areas of core caribou habitat, 66 percent of the high value stands must be left intact at any given time, the density of forest access roads is restricted for each watershed and only 30 percent of any watershed can be depleted at any one time through harvesting or natural phenomena such as fire,

insect and disease. A number of indicators required the development of new tools to determine such important values as natural age class variation over the licensed area, habitat suitability indexes, forest fragmentation and caribou location and habitat needs. To gain FSC certification, the company also needs to demonstrate effective consultation processes – especially with First Nations. The MBMF has set up Traditional Area Advisory Committees wherein the company meets regularly with FN and government to work together on issues within their traditional areas related but not restricted to the industrial forest operations. The MBMF is also involved in monitoring LLI but with an interesting twist aimed at increasing profile and awareness of SFM issues. Water quality on lakes and streams is monitored for the LLI by aboriginal and non- aboriginal school children as part of their curriculum.

The Western Newfoundland Model Forest (WNMF) LLI initiative formed the basis the ISO/CSA certification process and for its two industrial forestry partners. As well, one of the companies uses the LLI as a common check-off in developing district plans across the Province. The Newfoundland Provincial government, another partner with the WNMF, has integrated the LLI into its public planning team approach to its forest management plans across the province. This model forest's LLI work is also being transferred and adopted by the Innu Nation and the Provincial Department of Natural Resources in their collaboration to develop the certification process for the forest areas of Labrador.

The Fundy Model Forest in New Brunswick reports that its LLI have benefited its major industrial partner in planning and reporting on its SFM efforts and changed a number of forestry practices and inventory inputs to gain a finer scale and more robust data for its permanent sample plots.

A number of model forests with significant private landholdings within their boundaries facilitated the development and application of LLI to support the efforts of the private woodland owners in their area to develop certification schemes. In addition, at the Eastern Ontario Model Forest LLI are being used to enhance natural heritage planning and significant woodlands analysis work and have been instrumental in establishing data sharing agreements - all of which has been incorporated into several official plans and sub-regional, long-range planning initiatives.

In Alberta, the Foothills Model Forest used its 40 individual LLI that its partnership developed based on the CCFM C&I to publish a report on SFM in 2003. This work was adopted by their main forest industry partner, Weldwood of Canada Incorporated, for its Forest Certification program and for its 20 year

Forest Management Plan (that must be approved by the Province). Likewise, the provincial government is using the LLI work as a base to develop indicators of SFM for the province itself. Jasper National Park, a major land manager and partner with this model forest, is using the report as a key input into its deliberations to develop sustainable forest management plans specific to the mandate of the National Park. The FMF LLI team consisting of representatives from within its partnership has reviewed its LLI and will be presenting its recommendation to continue its LLI program to refine and to improve the indicators.

Understandably, each model forest and its partners have had unique experiences in through their involvement with the LLI process however, it is notable that there is concordance among the respondents regarding the utility of LLI in reporting on progress to SFM in the local area (although this has been deemed to demand excessive resources by some), in the evaluation of policies and regulations, in improving stakeholder capacity to provide more meaningful input and to provide guidance to forest practices for SFM.

The Model Forest Phase III (2002-2007) LLI Strategic Initiative has sought to bring together the indicators that were developed in Phase II into formats that are easily accessible by those engaged in SFM. Several individual Model Forests continue their efforts with the development, further research and adoption of local level indicators. Model Forests are also using LLI as the basis of reporting on their own SFM goals, and are providing LLI to industry, governments and First Nations for use in measuring and reporting SFM, to assist with public planning processes, and as the basis for achieving certification. These efforts engage people from individual Model Forests, CFS, Provincial and Territorial forest management agencies, forest industry, oil and gas industry, National Parks, and First Nations.

Evaluating Sustainability

Even once complete national data has been compiled, another challenge in evaluating progress toward sustainability is linking the indicators under the various criteria to make an overall assessment. During the CCFM C&I review, attempts were made to identify reference values for indicators, such as baselines, targets or thresholds, which could provide context for assessing the indicator. Because sustainability measures are still evolving, and because most of the forest management decision-making responsibility resides at the provincial and territorial level in Canada, few identifiable national targets or thresholds

have been established. Most of the reference values identified are baselines of past performance.

Work is underway in Canada and around the world to develop more sophisticated tools and techniques to make an overall assessment of sustainability. One promising tool appears to be the Multi-criteria Analysis (MCA) technique adapted for use with C&I by CIFOR. So far, this technique seems to have been applied most extensively at the local level, however, the Province of Ontario has been exploring its use at the provincial level to provide an overall assessment of their progress toward sustainability based on their C&I report. One possible approach to providing an overall assessment is to invite individuals from various sectors of society to score and weight each indicator in the report. The subsequent weighted scores can then be worked up into a score for each criterion or even an overall score. Furthermore, the weighted scores from groups of individuals can be analyzed to see how different sectors of society are evaluating progress toward SFM. This analysis can form feedback into the policy making forum, allowing for the development of policies designed to raise indicator scores for some or all sectors of society.

Conclusion

Over the past decade and a half, Canada has enjoyed many benefits from its collaborative relationships in the development of its national C&I framework. The C&I, by providing a framework for standardizing the national forest data collection and for helping to develop and implement a national forest inventory, have lead to the establishment of many linkages between all levels of interest and responsibility. The sharing of information and resources between jurisdictions and stakeholders has helped to build capacity and reduce reporting cost, and the framework has led to the development of sub-national and local level initiatives that help to evaluate policies and regulation, facilitate meaningful public input, and guide forest practices. A continued adaptive approach to the CCFM C&I framework and throughout the many linkages described in this paper will improve the framework as a tool to provide these benefits and ensure that C&I remain an important tool for helping Canadians achieve SFM.

Canada has seen the value of linkages among all levels of jurisdiction and seen improvements in the reporting of progress to SFM. Canada anticipates continued strong, collaborative relationships over the coming years in support of those taking on the challenge to refine and

promote the use of better indicators to report progress towards SFM at all levels.

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