

Decision Frameworks for Sustainable Forest Management Criteria and Indicators Initiatives

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Decision Frameworks for Sustainable Forest Management Criteria and Indicators Initiatives

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ABSTRACT

In April 2004, the Province of British Columbia, through the Forest Practices Board, engaged FORREX Forest Research Extension Partnership to collaborate with interested key parties and identify the work needed to complete sets of criteria and indicators (C&I) for British Columbia's forests. The following report is the third in a series of three that summarize the results of the 2004 foundation projects. It defines a decision framework to link criteria and indicators information to policy, management, and operational decisions (Area Three). This report presents the results of interviews with key representatives from both the forest industry and provincial agencies, and offers some interpretation of the data.

Generally:

- Two decision frameworks exist within the context of managing the British Columbia landbase: One framework to meet certification requirements and another to meet the legal/legislative requirements.
- These two decision frameworks are functioning independently of one another although mechanisms do exist which could be used to link them together.
- Data and information management are key issues that need to be addressed in both the short and long term.

The report concludes with a summary of the breakout sessions held to address this topic area at the "Common Ground for Criteria and Indicators of Sustainable Forests for British Columbia" forum that took place on February 18–19, 2005.

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FOREWORD

—Bruce Fraser (Chair)
Forest Practices Board

—John Dunford (Vice Chair)
Tolko Industries Ltd.

—Chris Hollstedt (Co-ordinator)
FORREX

The sustainability of British Columbia's forests is vital to the economic, social, and environmental well-being of our province. Over the years, we have invested much to develop criteria and indicators (C&I) of sustainability through research, certification, performance audits, and sustainable forest management planning. However, we realize today there is a great need to make these efforts more efficient. One answer is to develop common indicator sets that can be measured and reported at appropriate levels—and for a common purpose.

What exactly are criteria and indicators? Sets of values (called criteria) outline the elements of the forest ecosystems and the related social and economic systems that British Columbians believe should be maintained, or enhanced, when it comes to sustainable forest management. Indicators measure an aspect of a criterion and are used to assess the state of the forest, measure progress over time, and inform future decision making. Together, C&I characterize the essential components of sustainable forest management. Combined with a monitoring and information gathering and distribution system, they create a decision framework to assess progress and allow adaptations to achieve desired goals.

Over the past 10 years, much work has been done to develop C&I for sustainable forest management. However, efforts continue to be somewhat isolated and disparate, resulting in a lack of common ground and the need for collaboration.

Research institutes, universities, and government research groups are investigating social, economic, and biophysical criteria and indicators of sustainable forest management at the international, national, and regional level. In response to, and in support of, international commitments, the Canadian Council of Forest Ministers (CCFM) recently revised a set of national criteria and indicators for Canada's forests. Under the new *Forest and Range Practices Act (FRPA)*, the Province of British Columbia is currently setting objectives for 11 values and is looking for appropriate and meaningful science-based criteria and indicators for their effectiveness evaluation framework. Under the new *FRPA* legislation, licensees are defining results and strategies to achieve provincial objectives and seek meaningful local-level indicators. At the same time, the forest industry is also seeking third-party certification that requires performance indicators and monitoring frameworks. Finally, the Forest Practices Board retains its role of performing independent audits and reporting on forest practices throughout the province. All parties seek an effective, efficient, and meaningful mechanism to assess and report on sustainable forest management performance as well as inform future decisions.

The government of British Columbia, the forest industry, academia, and other key constituents are committed to collaborating on developing common C&I for measuring and reporting on sustainable forest management performance in British Columbia. These key constituents agree that a collaborative approach will improve communication, reduce duplication and redundancy, increase efficiency, and make more effective use of investment funds.

In April 2004, the Province of British Columbia, through the Forest Practices Board, engaged FORREX Forest Research Extension Partnership to collaborate with interested key parties and identify the work needed to complete sets of criteria and indicators for British Columbia's forests. The goal is to facilitate collaborative development of scientifically sound, commonly accepted C&I, and to increase awareness of the need for working models with generally acceptable methods of measurement and practical application.

Initial funders for the initiative included:

- British Columbia's Forest Practices Board; B.C. Ministry of Forests; B.C. Ministry of Sustainable Resource Management; and the B.C. Ministry of Water, Land and Air Protection¹
- Canadian Forest Products Ltd.
- International Forest Products Ltd.
- Riverside Forest Products Ltd.
- Tolko Industries Ltd.

Individuals from the following organizations are providing valuable input into the initiative:

- B.C. Ministries of Forests; Sustainable Resource Management; and Water, Land and Air Protection¹
- Canadian Forest Products Ltd.
- Council of Forest Industries (COFI)
- Forest Practices Board
- FORREX Forest Research Extension Partnership
- International Forest Products Ltd.
- Simon Fraser University
- Sustainable Forest Management Network of Centres of Excellence
- Tolko Industries Ltd.
- University of British Columbia
- Weyerhaeuser Company

We invite others from non-government organizations, First Nations, and communities to participate:

Since April 2004, constituents have been working to execute a comprehensive work plan. The foundation projects, completed in April 2005, focused on three main areas:

1. Determining common scientifically sound, useful, and effective criteria and indicators and monitoring systems for British Columbia's forests.
2. Assessing existing research, monitoring, modelling, and investment efforts.
3. Defining a framework to link criteria and indicators information to policy, management, and operational decisions.

Defining a decision framework to link C&I information to policy, management, and operational decisions is the focus of this third component of the C&I project. A decision framework is defined as a system where information flows into a corporate process to help users make informed decisions. Decisions can be linked back to the information used to support those decisions. Results can also be linked back to the original information. If a positive result occurs, that same information can be used again. If a negative result occurs, the information can be augmented with new research or data. To understand the various potential frameworks at play within the new "results-based" legislative framework that currently exists in the province of British Columbia, interviews were conducted with key representatives from both the forest industry and provincial agencies. This paper presents the results of these interviews and offers some interpretation of the data.

In the longer term, as a result of work completed in the three work plan areas, we hope to create a project called, "Common Ground for Criteria and Indicators of Sustainable Forests in British Columbia."

¹Participants names reflect government structure prior to June 2005. New names are, respectively: the B.C. Ministry of Forests and Range, the B.C. Ministry of Agriculture and Lands, and the B.C. Ministry of the Environment.

This project will mean that:

- efficient, effective, scientifically sound criteria and indicators at appropriate scales will be used by industry and agencies in planning, policy, implementation, monitoring effectiveness, and adjusting forest policy and practices;
- investments in criteria and indicator research monitoring and modelling will be streamlined, increasing efficient spending and use of expert capital while reducing gaps and duplication of effort; and
- resource management, policy, and auditing practitioners will understand and can use the criteria, indicators, monitoring, and modelling tools to assist them in their work.

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INTRODUCTION AND BACKGROUND

In April 2004, the Province of British Columbia, through the Forest Practices Board, engaged FORREX Forest Research Extension Partnership to collaborate with interested key parties and identify the work needed to complete sets of Criteria and Indicators (C&I) for management of British Columbia's forests. The goal was to bring these parties together to facilitate collaborative development of scientifically sound, commonly accepted C&I, and to increase awareness of the need for working models with acceptable methods of measurement and practical application.

Since April, representatives from the key parties have been working to execute a comprehensive work plan. The initial, or foundational, projects will be completed by the end of 2005, and are focused on three goals:

1. Determining common scientifically sound, useful, and effective C&I and monitoring systems for management of British Columbia's forests.
2. Assessing existing research, monitoring, modelling, and investment efforts.
3. Defining a decision framework to link C&I information to policy, management, and operational decisions.

The focus of this report is to summarize information gathered for the third goal of the work plan: Defining a decision framework to link C&I information to policy, management, and operational decisions.

What is a Decision Framework?

In the context of this report and subsequent discussions on this subject, a decision framework is defined as a system whereby information flows into a corporate process to help users make informed decisions. Decisions can be linked back to the information used to support those decisions. Results from these decisions can also be linked back to the original information. If a positive result occurs, that same information can be used again. If a negative result occurs, the information can be augmented with new research or data. Since one of the objectives of the C&I project is to develop a common set of indicators to be monitored, it is important to understand where the information collected from this monitoring work will go and what decisions it will support.

During discussions with the C&I Steering Committee, a broad decision framework was drafted and used to describe how information should flow. This framework is based on British Columbia's current legislative requirements and the use of adaptive management processes to adjust forest practices as information becomes available (Figure 1). It is important to note that key players in this framework, such as forest companies and various government agencies, have their own internal decision processes. A pivotal component of this section of the project is to understand what these processes are, what key decisions the specific information gathered within the framework will help support, and how these decisions will impact the various players. Identifying potential barriers and issues that may limit the successful implementation of any possible decision framework is also important.

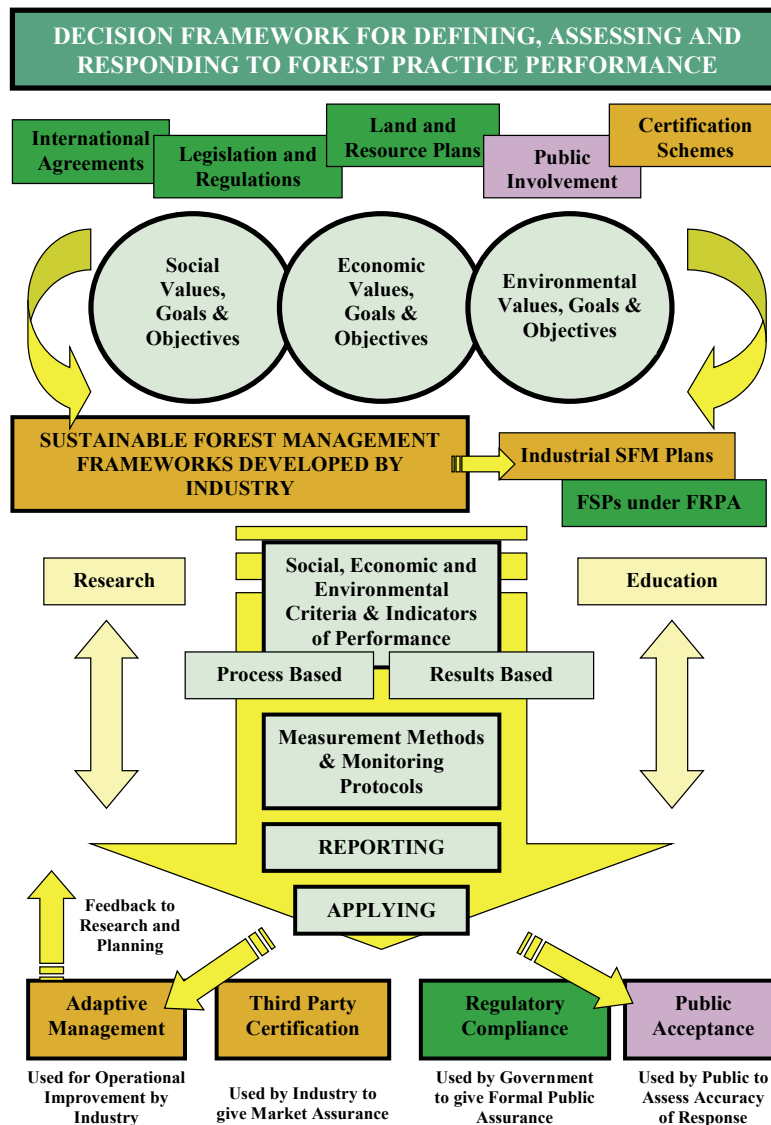


FIGURE 1 Decision Framework drafted by Bruce Fraser during the August 4, 2004 meeting of the Criteria and Indicators Steering Committee.

METHODS

The project team determined that a questionnaire was the most appropriate method to obtain information to meet the objectives of this project. We developed a series of 10 questions looking at intra-organizational decision processes, inter-organizational decision processes, and how each organization deals with change and knowledge. A sample of the questionnaire can be found in Appendix 1.

Information Collection

Once the questionnaire was developed, face-to-face interviews were set up with designated representatives from the Criteria and Indicators Project steering committee. Interviews were scheduled with six organizations including Tolko Industries Limited, Riverside Forest Products Limited (now part of Tolko), International Forest Products Limited, British Columbia Timber Sales, Canadian Forest Products Limited, and the British Columbia Ministry of Forests (MOF). A phone interview was conducted with Canadian Forest Products Limited and with the B.C. Ministry of Forest's *Forest and Range Practices Act (FRPA)* Resource Evaluation Program (FREP).

After each interview, a draft summary containing the results of the discussion, as well as any additional information, was completed. Our analysis and synthesis of the results of the interviews is presented in the next section.

RESULTS: ANALYSIS AND SYNTHESIS OF FINDINGS

Intra-organizational Decision Processes

The first series of questions was designed to identify information on internal corporate policy or objectives related to Sustainable Forest Management (SFM), how each policy/objective was implemented, how it is reflected in corporate value statements, and who carried the responsibility of ensuring the policy/objective's successful integration into the organization. The following summarizes results from this series of questions:

- a) All participating organizations in the survey have identified some form of corporate sustainability or environmental management policy. For forest companies, the creation of this policy tended to be associated with the requirements generated as part of their overall certification initiative. For the MOF, this policy is built into government legislation through *FRPA*.

It is important to note that all forest company participants in the survey currently have the minimum certification standard of International Organization for Standardization (ISO) 14001 with its associated environmental management systems and standard operating procedures. Some companies have, or are in the process of, achieving Canadian Standards Association (CSA) certification and other companies, Sustainable Forestry Initiative (SFI) certification. Both SFI and CSA certification systems are being used to support and improve forest management planning within the organizations.

- b) For the majority of surveyed companies, the basic corporate values associated with this environmental policy were reflected in statements that used terms such as integrity, honesty, and professionalism. Forest stewardship, profit, and progressiveness were also important terms used by some companies. For the government, integration and co-operation between the various resource agencies (B.C. Ministry of Water Land, and Air Protection [WLAP], FREP, MOF, and B.C. Ministry of Sustainable Resource Management [MSRM]), as well as within the various levels in each agency (district, regional, and provincial) was viewed as an important value for the success of the provincial effectiveness evaluation program (FREP). Quality assurance through the use of standardized protocols was also a value promoted by the provincial government.
- c) In all industry cases, the corporate component of the organization was identified as the location where the SFM or environmental objective/policy originated and where final reports are signed off. The responsibility and accountability for the achievement of this direction, however, rests with the

operational side of the organization. At the corporate level, there are staff dedicated to providing support and leadership to those who have the responsibility of delivering the outcomes at the operational level. Within each organization, there are specific people who have the responsibility for certification.

In the case of the provincial government, each ministry has a service plan with identified corporate performance planning measures for effectiveness evaluations and stewardship monitoring. These measures are the source of their environmental objectives and (or) policies. The delivery of this policy rests with FREP—a program that is sponsored by the Chief Forester with input from the Minister's Practices Advisory Council and the *FRPA* Joint Steering Committee. Though FREP, performance indicators are generated that link district, region, and province together through a continuous improvement cycle that brings forward recommendations to decision makers.

- d) Two organizations described their structures as hierarchical. The rest described their organizational structures as flat, containing both a corporate layer and an operational layer. Most of the staffing within the organizations surveyed exists at the operational layer.
- e) All forest company participants indicated that they are using some form of Environmental Management System (EMS) to track progress on identified performance indicators and to ensure continuous improvement. The system is also used for risk management assessments on the various decisions made at local levels to ensure any improvement is affordable. However, consistency in reporting and benchmarking can present difficulties when there are many operational woodlands trying to link into one system. One organization identified this as an issue for their various woodland divisions since all divisions were trying to use the same EMS to support the requirements for performance indicators associated with the CSA certification system. Other organizations identified GENUS and Local Landscape Ecosystem Management Simulator LLEMS/Atlas Simfor as tools that were in use (or development) to track information related to SFM, as well as to simulate the impacts of particular practices on the landscape.

Participants from the government's FREP program indicated that their performance framework is still being developed. They have taken a rigorous project management approach to this evaluation initiative and have established protocols, including various charters outlining objectives, roles, and responsibilities. These charters have been signed off by various high-level officials within the B.C. Ministry of Forests. FREP has two primary components—evaluation and resource stewardship monitoring. Evaluations are carried out at the provincial or regional level to assess the status or trends of resource values, and can be extensive or intensive in nature. Resource stewardship monitoring is carried out at the district or regional level, and consists of routine and extensive overview monitoring of on-the-ground forest practices to assess whether resource value objectives or strategies are being achieved. Work is currently ongoing to identify the relevant monitoring elements for the various *FRPA* objectives.

- f) All industry participants felt that their organization had the flexibility to deal with changes in customer demands since many had integrated woodland/market/mill teams. However, barriers to flexibility were identified, including government control over direction of the harvest. For example, 80% of a company's harvest could be coming from areas of major forest health concern or from areas that are highly constrained, which limits their ability to deal with customer needs. For some customers/markets, lumber with blue stain (wood affected by mountain pine beetle) is acceptable, while for others it is not. One organization identified their internal contracting requirements as a barrier to flexibility—specifically, a policy that requires them to accept the lowest bid on contracts. This organization felt that it not only reduces their flexibility to respond to client demands, but also creates problems with tracking chain of custody for wood or services purchased in the market place, a critical feature of some certification systems.

Government agencies indicated their goal is to try to be as flexible as possible through their quality assurance program; however, they have a long list of “customers,” which includes the citizens of British Columbia and Canada, as well as their own staff and the forest industry. They are currently using 34 primary evaluation questions with protocols and indicator sets driven by these questions. These questions are derived from a review process that includes stakeholder comments. Reports and extension notes are available on their Web site for continuous input into the process.

- g) All industry participants indicated that C&I associated with First Nations and public stakeholder groups could be easily tracked through their existing EMS. These indicators usually involve employment numbers, partnerships, joint ventures, etc. As with certification, there is usually corporate support or a policy that would guide operational-level representatives who are responsible for dealing with these groups.

For the provincial government, one of the values being monitored under the new legislation is cultural heritage. Establishing questions and indicators for this value has not yet begun at the time of this report, but the government hopes to engage the First Nations community in discussions to hear their input and issues. There is hope they can also engage the First Nations community to offer input on the other values as well, but that has been limited to date.

With regard to public stakeholders, FREP is using its Web site as a means to report indirectly to the public via documents and databases where information is stored and readily accessible. Special care has also been taken to generate reports that the public can understand, using summaries and extension notes in a user-friendly format.

Inter-organizational Decision Processes

The second series of survey questions was designed to identify information related to what systems participants are using to inform other agencies in the forestry community. It is important to state that an assumption exists around this series of questions. It is assumed that the information collected through the larger C&I initiative will be used by the various partners in the initiative to develop, validate, or adjust forest policy and (or) regulations, forest management standards, and market standards.

The response from the forest industry to this question was varied. For some forest industry participants, there is no process in place to inform other agencies that information has been collected, and doing so may, in fact, be corporately discouraged. Other respondents indicated that they would use various advocacy groups such as the Coast Forest Lumber Association (CFLA) and the Council of Forest Industries (COFI), or use their role as members on various boards or committees as a mechanism to bring their information forward. Finally, there are two participants whose companies are actively involved in policy code pilots and hope to use this mechanism as a way of influencing existing regulations and standards.

The provincial government hopes to use the results from their evaluation program to both inform policy and improve forest management standards through recommendations. To do this, they are using four different types of evaluation, each with a different purpose, and each answering different types of questions, including the following:

- **Compliance evaluation:** Assessing compliance with legal requirements (not part of FREP but linked to it).
- **Implementation monitoring:** Assessing progress towards a specific goal (including adoption of new practices, policies, or guidelines) and whether practices were implemented as planned (routine evaluation).

- **Effectiveness monitoring:** Assessing whether policies or practices are meeting management objectives, often using comparisons with baseline data (intensive evaluation).
- **Validation monitoring:** Assessing or verifying the basic assumptions under which specific management direction was developed (applied research to examine the cause and effect relationship between an ecological system and management action).

However, before any of these monitoring systems can be implemented, specific questions and indicators must be selected, piloted (to determine whether they can address the question posed), and then implemented throughout the operation. As the information from operational implementation is collected and validated, and trends are determined, adjustments will be recommended as a part of the continuous improvement process that is key to this program.

Knowledge Management

The final series of questions was designed to solicit information about how the various organizations participating in this initiative deal with knowledge and with change. For any decision framework to be successful, there must be mechanisms in place that will allow knowledge to be captured and successful change to occur. All industry participants in the survey expected their Environmental Management System (EMS) will be the key tool for capturing information related to C&I. When information captured in the EMS indicates that a change is required, they will implement a set of procedures to carry out the change. The most common method of introducing change is to establish it as a Standard Operating Procedure (SOP). However, forest companies also identified that using this EMS has limitations. When the number of business units (or woodland operations) using the system increases, issues of reporting, consistency, and benchmarking become problematic. One organization that we interviewed recognized this issue and is currently working on a solution through its GENUS system.

Within the government, some protocols for reporting currently exist and a quality management framework should be approved by the end of March, 2005. Based on this approval, protocols will be developed regarding the correct questions, indicators, and quality control of field data. A business case for data management is also being developed that will link existing systems; the goal is to maintain accessibility for the various stakeholders involved. Another goal for this system is to document lessons learned.

All survey participants indicated that training is encouraged throughout their organization, especially for safety issues and new procedures. It appears that the most common tool used to identify the training needs of individuals is their personal work or performance plan. These performance plans are most often an annual procedure with emphasis placed on the individual identifying and then fulfilling the requirements to achieve their goals. Since some of the companies involved in the survey have performance bonuses associated with the achievement of corporate goals, the focus of an individual's goals tend to be personal as well as corporate.

The final question in the interview process asked participants to identify any barriers or challenges to acquiring and using information. A number of items were identified and are summarized in the following list.

a) Data collection and management:

Examples of issues:

- Government transfer of responsibility for data collection to industry (e.g., Timber Supply Reviews [TSRs], forest health) without any incentive to collect this information.
- How to best capture the information and how to fund it—for example, in Forest Science Program-funded proposals that are multi-agency, how do you pay for the information (including spatial

- data)? Who stores it? Whose standards do you follow? Who will manage the data?
- Partnerships between the Crown and industry—who is responsible for what?
 - On Timber Supply Areas, many companies including BC Timber Sales do not have data collection in their mandates. How to deal with this issue?
 - When dealing with various partners in the operational world (including First Nations), who will be responsible for practices?
 - Reduced funding for data collection and management.
 - Government will be collecting a lot of information through their effectiveness evaluation program—how will that data be stored, maintained, accessed, and funded?

b) Landscape-level unit planning:

Example of issues:

- A lot of landscape-level unit planning is being done for biodiversity conservation, but what about for general forest management purposes? There is no one managing the bigger picture at the TSA level.

c) Link between C&I and some on-the-ground, big picture decisions/implications such as Timber Supply Review

Example of issues:

- A lot of data will be collected for use in C&I monitoring—how will this data link to such things as Timber Supply Reviews?
- Where is the link between the collection of information and the adaptive management cycle on the ground and between partners?

d) Downsizing of government:

Example of issues:

- Due to the downsizing of inventory staff, it is becoming increasingly difficult to access information from such ministries as MSRM.

e) Current inventory

Example of issues:

- Current state of inventory makes interpretation for some C&I information problematic (i.e., not up to date or accurate).

f) Decision-support tools

Example of issues:

- Tools are needed that can gather, synthesize, and apply information for the operational level in a consistent manner.

DISCUSSION

Discussion of Information Generated by the Survey

As a result of information synthesized from the survey, a few factors warrant further discussion.

1. Forest companies are collecting information related to their objectives under certification. However, the link between data collection and current forest management practices seems limited for some companies and advanced in others. For those that have limited links, the causes appear to be the following:
 - The relative newness of certification to the forest industry.
 - A reliance on the existing standards developed under the previous Forest Practices Code.
 - Confusion and debate over which C&Is to measure.
 - The lack of decision support tools to translate information into operations.
2. The minimum certification undertaken by all forest companies surveyed is ISO 14001. With the adoption of ISO 14001, all companies must implement an Environmental Management System (EMS) evaluating their current procedures and putting them on a cycle of continuous improvement through the use of various performance measures. Some forest companies are modifying this EMS to capture broader performance measures associated with sustainable forest management planning and practices.
3. The British Columbia provincial government has implemented a *Forest and Range Practices Act* Resource Evaluation Program (FREP). This program is a long-term government commitment to assess whether forest and range practices are achieving management objectives for 11 resource values identified under the new results-based legislation. To date, a number of pilots have been established to evaluate indicator sets that were designed to answer specific questions associated with the effects of forest management on a certain resource value. The goal of this evaluation process is that it will lead to recommendations on adjustments in forest policy and practices, and become a process for continuous improvement.
4. Both government and industry are collecting information to continually improve their decisions, but both systems are functioning independently of each other. If Figure 1 is to truly represent the decision framework that we are striving for in British Columbia, can these two decision frameworks be linked in some manner so that as information is collected it can inform both systems? Is this continuous improvement possible within our current legislative and legal frameworks?
5. Issues related to data and information management were identified by all survey participants. Strategies to deal with them seem to be an essential part of any process that gets carried forward.

February 18–19th Breakout Session Discussion

During the forum “A Common Ground for Criteria and Indicators of Sustainable Forests for British Columbia” held on February 18–19, 2005 participants had the opportunity to offer input on the results of this report. The following is a brief summary of the results from these breakout sessions.

Policy Decision Frameworks

1. During the breakout session related to policy decision frameworks, participants seemed to agree that the province has three large decision frameworks in play. The first is the provincial decision framework that relies on current legislation. The second exists within the majority of forest companies and is the certification framework that tends to function at the local level. The third exists within the public and is a “buzz” framework used to facilitate public dialogue. This third framework is new and its role needs to be more clearly defined. The breakout group also suggested that issues related to land-use planning objectives and (or) tenure reform should be added into the decision frameworks discussion.
2. The breakout session did discuss the decision framework specifically related to public dialogue. The group felt that this public framework was related to personal welfare and security and any indicators associated with this decision process need to be general enough to speak to various members of the public (urban as well as rural) but personalized enough so that people in Vancouver and Victoria can understand what happens in the forest. Perhaps there is an opportunity to use collected data to develop information that can influence this framework; however, this would require a strategy that takes into account the short life cycle of government, but ultimately focuses on longer life cycles.
3. It appears that the C&I project is trying to take a systems approach to identifying indicators, but currently the indicators being measured are going into an uncontrolled decision process. There needs to be a fit between indicators and the corporate frameworks. It was also pointed out by the group that C&I frameworks may not account for all contingencies (e.g., mountain pine beetle).
4. According to the discussion group, there is a strong need for good data and good data management to inform the Sustainable Forest Management (SFM) picture. This data needs to be readily available to all parties (industry, environmental non-government organizations, etc.) and be presented in a neutral and non-judgmental manner to reduce the conflict of “whose data is right.” There are some elements that need to be “authoritative” and which would be used to influence decision makers. However this “authoritative” dataset would require a buy-in strategy that uses the Canadian Council of Forest Ministers (CCFM) framework as possible leverage. It was also pointed out, however, that data will only provide information; what is done with that information is part of whatever decision framework the data is plugged into—for example, the decision framework used by policy makers. Unfortunately, there is a lack of understanding of those information needs—decision makers can’t always identify what data they need.
5. The final discussion in this breakout group on decision frameworks in policy looked at transferring indicator information and decisions through reporting. Reporting should be part of any policy framework; however, it was noted that reports such as the “State of the Forest” should look at all influences on the forest, not just forest practices. It was also noted that there needs to be an independent watchdog to hold the various agencies accountable for reporting. In most forest companies, reports are generated for their shareholders on an annual basis, while the government follows a different reporting process. The Forest Practices Board may have a role to play in ensuring that the appropriate reporting is carried out. Besides the “State of the Forest” reports, it was suggested that on-line Geographic Information Systems (GIS) (i.e., spatially explicit) databases were seen as a good method of extending the information. However, the breakout group also suggested there should be indicators associated with how well the reported information is being transferred, i.e., the frequency of indicator data reported in the newspaper.

Decision Frameworks in Management and Operations

1. Initial discussions in the Decision Frameworks in Management and Operations breakout group focused on what drives decision making and how SFM indicators integrate with management decisions. Their discussion focused on two drivers—provincial regulation and certification. Although these two drivers exist, the group agreed that they are not necessarily equal. In fact, the legal driver may possibly clash with other frameworks since it appears to be set at a lower standard than existing SFM initiatives. The group also recognized the impact from the “social buzz” and thought that an incremental legislative framework (with potential to increase the legislative standard) could help address some of the issues that arise.
2. Following the discussions on drivers in decision making, the breakout group looked at how SFM indicators integrate with management decisions. According to participants, many forest companies are using SFM indicators and collecting data accordingly, but that information is not necessarily being used for SFM decision making. It appears that SFM plans are not necessarily linked to management and operations, i.e., the SFM “do-loop” is not necessarily integrated with the rest of the management “do-loop.” Typically, certification initiatives start with the status quo and have the potential to result in improved practices, but usually with indicators that are tied to results of management. There was also some discussion around *FRPA*'s failure to be results-based and its potential for interpretation problems. An example of socio-economic indicators was used; many companies are tinkering in this area (driven by Land Resource Management Plans), but that is not reflected in *FRPA*.
3. Although there was discussion on a number of issues related to the various decision-making frameworks, the Environmental Management System (EMS) currently being used by most British Columbia forest companies was identified as the most likely way of ensuring changes in forest practices and of making sure improvements are based on problem identification. However, participants asked the question: Will the SFM indicators be brought into EMS and will there be alignment with the FREP indicator set? It was identified that work needs to take place to bring these two sets/approaches into line so that both can get rolled up into an EMS for both industry and government.

APPENDIX 1 SURVEY QUESTIONNAIRE

The following sets of questions are designed to solicit information related to the place and purpose of your organization in relation to decision processes within your organization and between organizations within the forestry community. This information will help define where C&I data informs your corporate decisions, or decisions you influence.

Intra-organizational Decision Processes

1. How would you classify your organization?
 - i. Private – Nationally owned
 - ii. Private – Internationally owned
 - iii. Public – Government organization

- 1a. What is your corporate SFM policy or objective?

- 1b. What are the basic values/beliefs/attitudes that are in place within your organization to achieve this policy or objective?

- 1c. Who or what part of the organization is responsible and accountable for achievements in this corporate objective?

- 1d. What is your role?

- 1e. In your opinion, do all levels of the organization understand and have the tools to contribute to the organization achieving this objective?

- 2a. How would you best describe your organizational structure?
 - i. Flat
 - ii. Hierarchical
 - iii. Other

- 2b. Please describe the layers within your organizational structure?

3. Please describe your management decision processes or “routines” that take place (including information collection and tools, reporting requirements, risk assessments, and performance measures) at the various levels.

- 4a. How would you describe your flexibility in responding to changes in customer needs and demands?

- 4b. Please describe the process that your organization would proceed through to deal with this change in customer needs and demands.

- 5a. With regards to your intra-organizational decision process where do you believe the appropriate fit for informing or engaging with the Aboriginal community is within the context of C&I information flow?

5b. With regards to your intra-organizational decision process where do you believe the appropriate fit for informing or engaging with the public at large (PAGs) and other stakeholders is within the context of C&I information flow?

Inter-organizational Decision Processes

6a. Does your organization play a role in informing other agencies in the forestry community? Yes or No?

6b. If yes, is your information used for:

- i. Developing or adjusting forest policy/and or regulations?
- ii. Development or adjustment of Forest Management Standards?
- iii. Developing or adjusting market standards?

6c. Please describe the process your organization uses to inform the other agencies.

The following questions are designed to solicit information related to how your organization deals with change and knowledge.

7. Does your organization have some form of “Total Quality Management System”? If yes, please describe it and your decision support tools that are in place to make it work (please mention the organization levels these tools are used to inform)?

8. Describe how your organization stores “knowledge” (is it part of your TQM system or is it re-created each time it is required by means of the specific individuals involved?). For example, how does your organization document standard practices for vegetation management?

9a. What learning experiences are encouraged/supported in your organization?

9b. Does your organization have policies around continuous learning/training?

9c. How is this policy implemented and evaluated?

10. Can you identify barriers that exist within your organization with regards to acquiring and using information?

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Web Sites

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- Ecosystem Management: Concept and Approaches. URL: <http://silvae.cfr.washington.edu/ecosystem-management/Decisionmaking.html>
- The Performance-Based Management Handbook. URL: www.orau.gov/pbm/pbmhandbook/pbmhandbook.html
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