



Argentina

Australia

Canada

Chile

China

Japan

Mexico

New Zealand

Russia

Republic of Korea

Uruguay

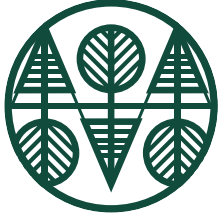
USA



Montréal Process First Forest Overview Report 2003

Table of Contents

pg 02	Executive Summary
pg 03	Introduction
pg 04	Background
pg 05	About the Montréal Process
pg 07	Highlights on Trends
	Criterion 1 – Conservation of Biological Diversity
	Indicator 1.a – Extent of forests by forest type relative to total forest area
pg 10	Criterion 2 – Maintenance of Productive Capacity of Forest Ecosystems
	Indicator 2.a – Area of forestland and net area of forestland available for timber production
pg 11	Criterion 3 – Maintenance of Forest Ecosystem Health And Vitality
	Indicator 3.a – Area and percent of forested area affected by process beyond historic variation
pg 12	Criterion 4 – Conservation and Maintenance of Soil and Water Resources
	Indicator 4.b – Percent of forest land managed primarily for protective functions
pg 13	Criterion 5 – Maintenance of Forest Contribution to Global Carbon Cycles
	Indicator 5.a – Total forest ecosystem biomass and carbon
pg 14	Criterion 6 – Maintenance and Enhancement of Long-term Multiple Socio-Economic Benefits to Meet Needs of Societies
	Indicator 6.5.a – Direct and indirect employment in the forest sector and forest sector employment as a proportion of total employment
pg 16	Criterion 7 – Legal, Institutional and Economic Framework For Forest Conservation and Sustainable Forest Management
	Indicator 7.4.b – Scope, frequency and statistical reliability of forest inventories, assessments, monitoring and other relevant information
pg 18	Conclusions, Observations + Next Steps
pg 21	Annexes + Weblinks



Montréal Process First Forest Overview Report 2003

Executive Summary

Launched in 1994, the “Montréal Process” is one of nine regional and international processes whose member countries are seeking to implement criteria and indicators for sustainable forest management to guide the monitoring, assessment and reporting on their forests and improve forest policies and practices. The 12 countries of the Montréal Process span six continents and together account for 90 percent of the world's temperate and boreal forests, 60 percent of all forests and 45 percent of world trade in forest products.¹

In 2003, the 12 Montréal Process countries developed their first Country Forest Reports on the sustainable management of their forests using the 7 criteria and 67 indicators adopted in 1995. Designed for use by policy makers, the Country Forest Reports present the state of and trends in forests at the national level based on contemporary scientific understanding of forest ecosystems and the values society attaches to forests.

The purpose of this *Montréal Process First Forest Overview Report: 2003* is to highlight for policy makers, other stakeholders and the international community the progress in the use of criteria and indicators as reflected in the country forest reports. To this end, the *Overview Report* presents data available from all 12 countries for one indicator under each of the seven Montréal Process criteria which address:

- 1 Biological diversity
- 2 Productive capacity of forest ecosystems
- 3 Forest ecosystem health and vitality
- 4 Soil and water resources
- 5 Forest contribution to the global carbon cycle
- 6 Socio-economic benefits and
- 7 Legal, institutional and economic framework.

The Overview Report illustrates the data found in the country reports for many more indicators. It does not represent an assessment of the sustainability of forest management in Montréal Process countries. The Country Forest Reports reveal that all countries have made progress in reporting forest information since 1997 when countries prepared their *First Approximation Reports*. Despite their differences, all countries show some similar trends, such as decreased forest conversion to agriculture or urban land, increased regulation to protect soil and water, and small decreases in forest employment relative to overall employment. While the capacity to collect and report on indicators varies greatly among countries, no country is able today to report on all 67 indicators for one or more of the following reasons:

- 1 The data have not been traditionally collected (e.g. data on non-wood forest products),
- 2 there is no scientific agreement on how the data should be collected, creating data gaps at sub-national levels (e.g. data on soil and water resources) and
- 3 there is little or no scientific understanding of how to measure an indicator (e.g. forest fragmentation).

Nevertheless, considerable improvement in the ability of countries to report on forests using the Montréal Process criteria and indicators is expected over the next five years. It is also anticipated that the criteria and indicators will increasingly be used as a framework for strategic planning, expanding forest inventories, involving stakeholders and communicating progress to policy makers at national and sub-national levels. They may also provide a useful model for monitoring, assessment and reporting on other natural resource conditions, such as rangelands, mining and freshwater.

Member countries agree that the Montréal Process Working Group has provided many benefits as an international forum for collaboration, including catalyzing national efforts and promoting a shared view about what constitutes sustainable forest management and how to measure it. The exchange of information and experience has enabled 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 capacities to report on sustainable forest management.

To further increase country capacity to report using criteria and indicators and inform policy makers, the Working Group and its members will focus on the following actions over the next five years:

¹ The Montréal Process countries include Argentina, Australia, Canada, Chile, China, Japan, Korea, Mexico, New Zealand, Russian Federation, United States of America and Uruguay.

Introduction

- 1 Review, refine and share data inventory protocols to build capacity for reporting;
- 2 Develop extension materials on national and sub national applications of criteria and indicators;
- 3 Enhance technical collaboration among member countries;
- 4 Review and as needed refine the Montréal Process indicators;
- 5 Make the achievements of the Montréal Process more visible and easily available at all levels;
- 6 Develop strategies to help countries mobilize resources to collect needed data;
- 7 Continue to urge broad participation of relevant stakeholders within countries;
- 8 Encourage universities and other educational institutions to incorporate the latest information on sustainable forest management and criteria and indicators;
- 9 Encourage national and international institutions to carry out research on indicators difficult to measure;
- 10 Increase communication, collaboration and cooperation with other criteria and indicators processes;
- 11 Use criteria and indicators as the basis for national reporting on sustainable forest management to international fora, including the UN Forum on Forests (UNFF);
- 12 Seek international endorsement of a global set of criteria to provide a framework for existing regional and international criteria and indicator processes;
- 13 Promote application of forest criteria and indicators to other sectors and to international initiatives on indicators for sustainable development; and
- 14 Encourage other countries to become members of the Montréal Process Working Group.

In 2003, the 12 Montréal Process countries developed their first Country Forest Reports using the 7 criteria and 67 indicators for sustainable forest management that they adopted in 1995 to assess the state of and trends in their forests at the national level. The purpose of this *Montréal Process, First Forest Overview Report: 2003* is to highlight for policy makers and forest managers, other stakeholders and the international community the progress in the use of criteria and indicators reflected in the Country Forest Reports.

The *Overview Report* illustrates this progress by presenting in section IV the data available from all 12 countries for one indicator under each of the seven Montréal Process criteria. This information is illustrative of the kinds of information the reader can expect to find in each of the Country Forest Reports for a number of the 67 indicators. Readers are encouraged to explore individual Country Forest Reports to give context to the information presented in this *Overview Report* (see Annex 1 for Web links).

Section II provides general background information on forests and criteria and indicators.

Section III provides background information on the Montréal Process.

Section V presents general conclusions and observations about the Montréal Process as agreed by member countries, and identifies a series of next steps for the Montréal Process.

The Montréal Process is unique in bringing together diverse countries from around the globe to address the shared goal of sustainable forest management.

The preparation of the Country Forest Reports 2003 has required dedicated efforts by all Montréal Process countries and reflects the commitment of each country to implement criteria and indicators to report progress toward the sustainable management of their forests and facilitate informed decision making in both the public and private sectors.

Background

Forests are integral to the quality of human life and the quality of our environment. They provide food, fuel, shelter, clean water, medicine and employment for people around the world. Forests are home to 70 percent of the world's terrestrial animals and plants. Forests clean the air we breathe, reduce concentrations of greenhouse gases in the atmosphere, keep sediments from entering lakes and rivers, and protect against flooding, mudslides and erosion. Forests are inherently resilient ecosystems and a renewable resource. When managed in a sustainable way, they can continue to supply current and future generations with a wide range of essential ecological, social and economic goods and services.

The Rio Earth Summit of 1992 first popularized the concept of sustainable forest management as the forest sector's contribution to sustainable development and recognized a role for criteria and indicators in promoting the goal of sustainable forest management. In response, 12 countries representing 90 percent of the world's temperate and boreal forests recognized the mutual benefit of working together to develop "criteria and indicators for sustainable forest management" in order to provide a common framework for describing, assessing and evaluating progress toward sustainable forest management at the national level.

This initiative is now known as the "Montréal Process." Today, some 150 countries are participating in nine regional and international processes to develop, implement and use criteria and indicators as tools to characterize sustainable forest management, coordinate data collection, storage and dissemination, monitor and assess the state of trends in forest conditions, and inform decision-making. These efforts are supported by a number of international organizations, including the Food and Agriculture Organization of the United Nations (FAO), International Tropical Timber Organization (ITTO), Center for International Forestry Research (CIFOR) and International Union of Forestry Research Organizations (IUFRO).

The contribution of criteria and indicators to sustainable forest management has been recognized by the international community through the UN Commission on Sustainable Development's Intergovernmental Panel on Forests (IPF, 1995-1997) and its successor, the Intergovernmental Forum on Forests (IFF, 1997-2000), as well as through the UN Forum on Forests (UNFF) established in 2000.

The World Summit on Sustainable Development (WSSD) hosted by South Africa in September 2002 reaffirmed global commitment to sustainable forest management through the Johannesburg Plan of Implementation. Further, the *International Conference on the Contribution of Criteria and Indicators to Sustainable Forest Management: The Way Forward* hosted by Guatemala in February 2003 provides a number of recommendations for national and international action to further enhance the development, implementation and use of criteria and indicators.

About the Montréal Process

A – Montréal Process Working Group

The Montréal Process Working Group on Criteria and Indicators for Conservation and Sustainable Management of Temperate and Boreal Forests (known as the Montréal Process Working Group) was launched in 1994 and now has 12 member countries: Argentina, Australia, Canada, Chile, China, Japan, Korea, Mexico, New Zealand, Russian Federation, United States of America and Uruguay. These countries span the globe and together account for 90 percent of the world's temperate and boreal forests, 60 percent of all forests, 35 percent of the world's population and 45 percent of world trade in forest products.

The Montréal Process Working Group meets regularly in member countries on a rotational basis. These meetings typically include representatives of other criteria and indicators processes, international organizations such as the FAO and ITTO, environmental groups and the private sector. Domestic stakeholders are consulted by many member countries and may participate in Working Group meetings as part of country delegations.

The Montréal Process Working Group is supported by a Liaison Office located in Ottawa, Canada, and by a Technical Advisory Committee (TAC) established in 1996 and comprised of technical experts from the Montréal Process countries. The TAC provides technical and scientific advice to members on implementation of the Montréal Process criteria and indicators. To date, the TAC has provided advice on issues related to data collection, storage and dissemination, indicator measurement and reporting.

B – Montréal Process Criteria and Indicators

The member countries of the Montréal Process Working Group agreed via the Santiago Declaration of 1995 to a comprehensive set of 7 criteria and 67 indicators to assess the state of and trends in their forests at the national level. The seven criteria characterize the essential components of sustainable forest management; the indicators provide a way to measure those essential components. The Montréal Process criteria are:

- 1 Conservation of biological diversity (9 indicators)
- 2 Maintenance of productive capacity of forest ecosystems (5 indicators)
- 3 Maintenance of forest ecosystem health and vitality (3 indicators)
- 4 Conservation and maintenance of soil and water resources (8 indicators)
- 5 Maintenance of forest contribution to global carbon cycles (3 indicators)
- 6 Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies (19 indicators)
- 7 Legal, institutional and economic framework for forest conservation and sustainable management (20 indicators)

Together these seven criteria represent a holistic approach to forest management, addressing the full range of forest values. The 67 indicators associated with these criteria are listed in Annex 2.

While some of these indicators are quantitative in nature (e.g. the percentage of a country's forest cover), others are qualitative or descriptive (e.g. indicators related to forest planning, public participation, and investment or taxation policies). Measurement and reporting on indicators provide information about forests and, over time, the progress toward sustainable forest management.

About the Montréal Process *continued*

Together, the Montréal Process criteria and indicators form a framework for answering the fundamental question: “What is important about a country’s forests?” The criteria and indicators characterize forests as ecosystems, which provide a diverse, complex and dynamic array of environmental, social and economic benefits and services. Member countries increasingly use criteria and indicators as a framework for monitoring, assessment and reporting on national progress. A number of countries also see criteria and indicators as providing a useful framework for developing sub-national policies, management plans, inventories and criteria and indicators to promote sustainable forest management.

The Montréal Process criteria and indicators are a basis for reporting on all forests in a country, including public and private forests, tropical forests and plantation forests. They are designed to allow for national flexibility in their application. In some cases, countries have adapted the criteria and indicators to reflect national circumstances, which vary considerably among the wide range of countries involved in the Montréal Process.

Working Together

As demands on the world’s forests increase, so too does recognition of the need to bring countries together to work on common problems. The Montréal Process is an example of this collaboration. The process itself has benefited all 12 member countries. It has promoted common goals, improved national capacities to report on forests, helped set national priorities and focus resources and clarified international expectations for sustainable forest management. It has built confidence and trust among countries with diverse forest ecosystems, ownership patterns and socio-economic conditions.

C – Work Leading to the 2003 Country Forest and Overview Forest Reports

Three major efforts of the Montréal Process Working Group provided the building blocks for the Country Forest Reports 2003 and for this *Montréal Process, First Forest Overview Report: 2003*.

In 1997, the Montréal Process Working Group prepared and issued *A First Approximation Report of the Montréal Process* on the institutional capacity of member countries to collect data and report on criteria and indicators. The joint report was based on national reports by member countries on the availability of data relevant to the 67 indicators. These first country forest reports provided baseline information and highlighted gaps in the data available for each indicator and the ability of countries to report on an indicator.

In December 1999, the Montréal Process issued *Forests for the Future*, a brochure on the Montréal Process designed to raise public and political awareness of the potential contribution of criteria and indicators to promoting forest conservation and sustainable management.

In April 2000, the Montréal Process published *The Montréal Process: Progress and Innovation in Implementing Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests*. This document was presented at the 8th Session of UN Commission on Sustainable Development. The report highlighted the accomplishments of member countries related to implementing criteria and indicators, including capacity building, data collection, forest management, policy development, regulation and technical cooperation.

Highlights in Trends

This section illustrates examples of the forest information that is available for each Montréal Process country in the Country Forest Reports 2003. For each of the seven criteria, beginning with Criterion 1-Conservation of Biological Diversity, available data for the 12 countries is synthesized for a single indicator. In each case, the process used to develop comparable data is briefly described and observations, drawing on the experience of member countries, are made about the results. It should be noted that these are highlights and, as such, do not represent an assessment of the sustainability of forest management in Montréal Process countries.

Criterion 1

Criterion 1 – Conservation Of Biological Diversity

Indicator 1a – Extent of forests by forest type relative to total forest area

The conservation of biological diversity is an essential component of sustainable forest management because ecological processes and viable populations of species characteristic of forest ecosystems are dependent on a contiguous ecosystem or ecosystems of a certain minimum size. Each forest type is considered to represent a distinct ecosystem and is itself composed of a variety of ecosystem components. While species populations fluctuate over time in response to forest maturing and disturbances such as fire, their long-term trends reflect habitat extent or condition. If sufficient area of each forest type is maintained, these ecosystems can better withstand loss from fires, hurricanes or typhoons, disease, insects and other pests, and other disasters. Figure 1 shows the extent of forest area over time by country. Figure 2 shows the percent of forest cover in each country by forest type (conifer or broadleaf).

Comments on Data and Data Collection Process

Although considered accurate, data based on historical documents and model estimates are of limited precision. In addition, advances in assessment methodologies and shifts to ecological definitions of forests in recent years have in some cases led to recognition of greater amounts of forest area. For example, with advances in the analysis of satellite mapping and changes in data, Australia shows an increase in forest area. Thus, caution should be used when interpreting small percentage changes in forest area of the past 20 years. Some Montréal Process countries contain tropical forests and the acreage of these forests is included in these data.

Criterion 1 *continued*

Observations

Total forest cover of the Montréal Process countries is 875.37 million hectares (ha). The percentage of forest cover varies widely across countries. This is because a number of countries, such as Argentina, Australia, Chile and China, have significant areas of desert and other non-forest eco-types. Historical records and modeling data show significant declines in forest area in many countries over recent centuries. Rapid declines can often be linked to phases of human migration; for instance, when major European immigration first occurred in Canada, New Zealand and the United States, or during periods of internal regional colonization in Argentina, Chile and Mexico. Rates of forest decline decreased in the late 20th century.

Of the 12 Montréal Process countries, three currently show declining native forest areas: Australia, Korea and Mexico. This change is due to various factors, including continued pressure for conversion of forestlands to agricultural and livestock production. In the case of Mexico, although natural forest is decreasing, overall forest cover has increased because of investments in plantation forests. In some countries, plantations are increasingly meeting national demand for wood. In New Zealand, 99.5 percent of wood production for both domestic and export consumption is met from plantations. In other countries, a variety of environmental, social and economic reasons have resulted in an increase in forest area. In the United States since the 1920s, increased agricultural efficiency has resulted in the reforestation of marginal farmland.

Figure 1 – Extent of forest area over time by country

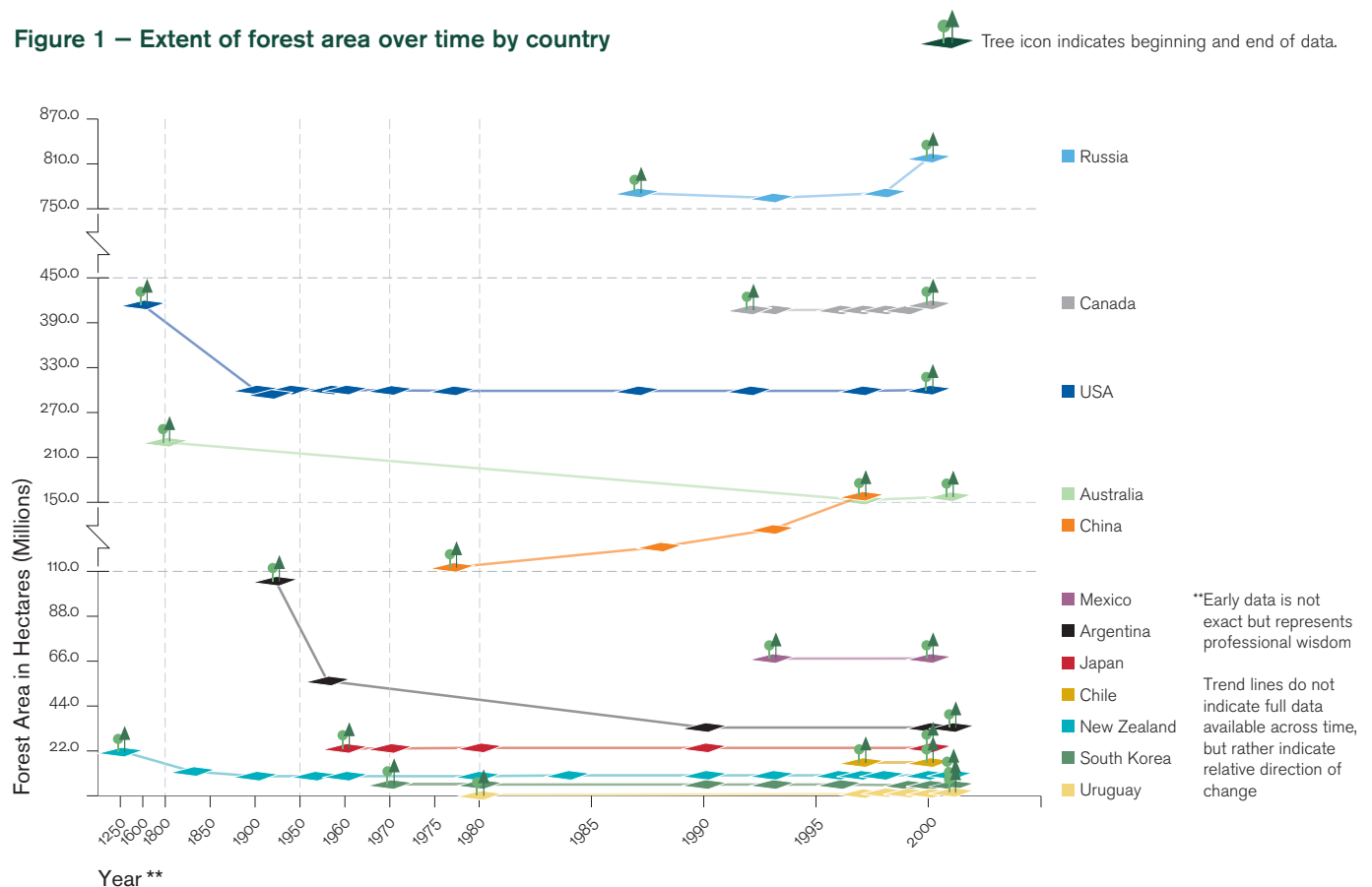
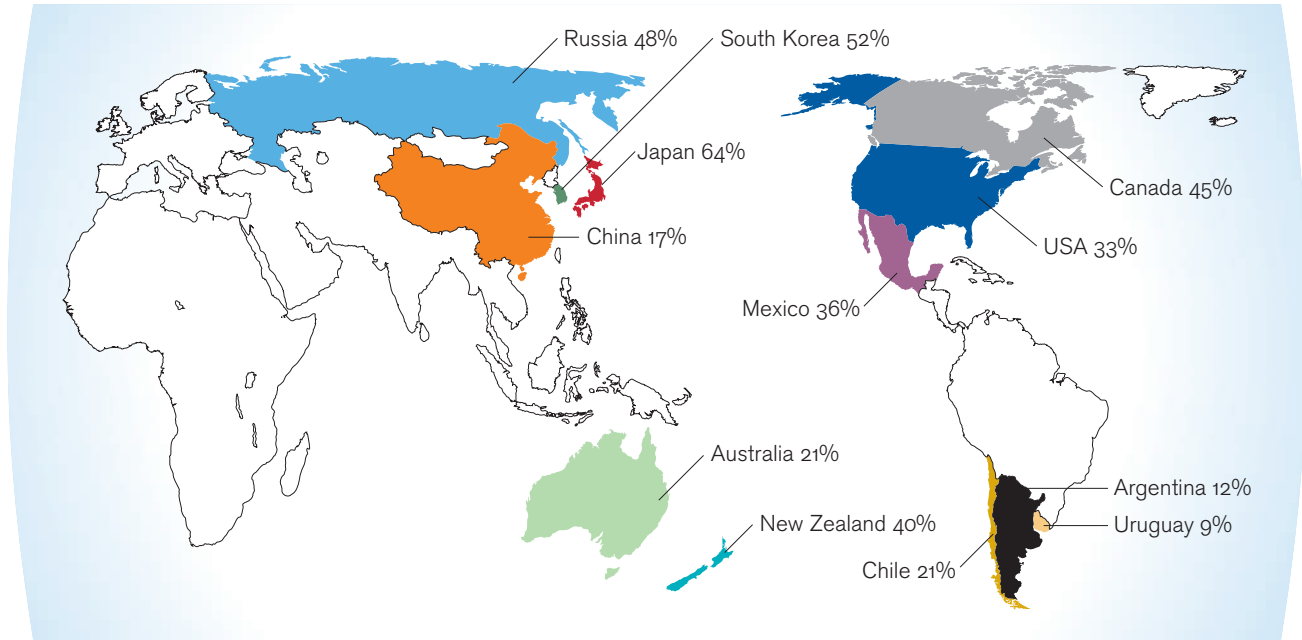
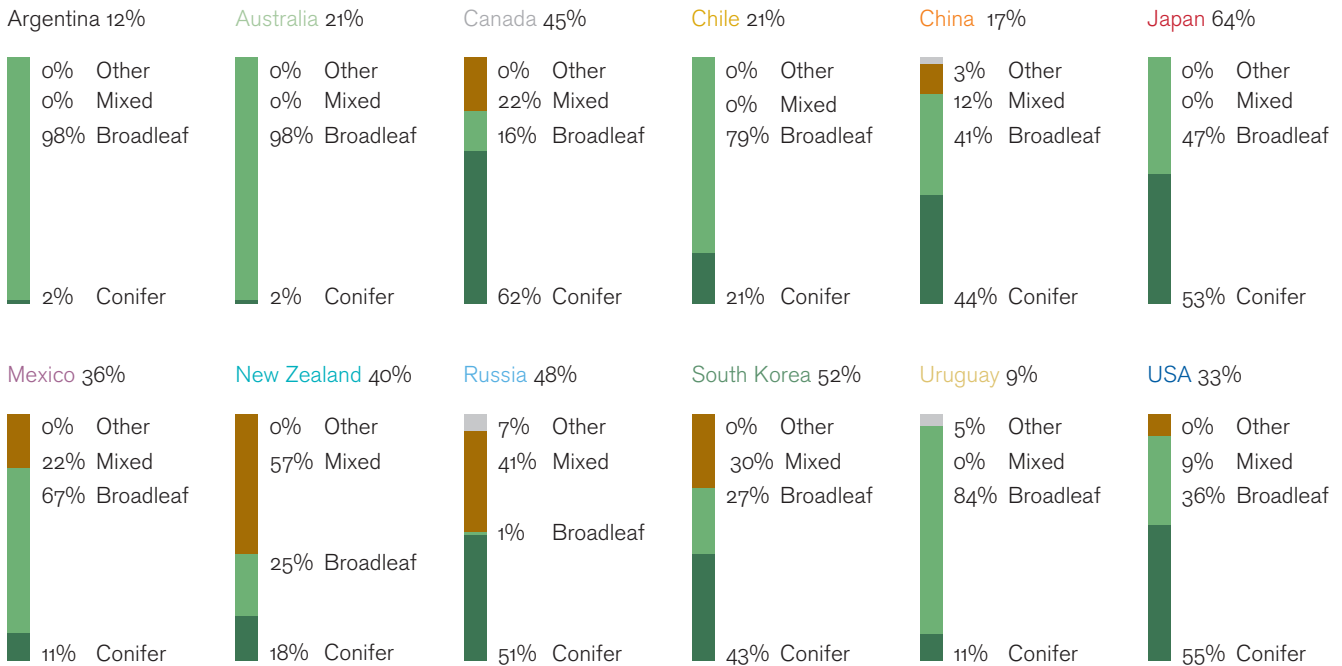


Figure 2 – Percent of forest cover in each country by forest type and country

Percent of forest cover in each country



Percent of forest cover by forest type



Other includes bamboo, palms or undescribed forests; *Mixed* refers specifically to mixed broadleaf/conifer forests

Criterion 2

Criterion 2 – Maintenance of Productive Capacity of Forest Ecosystems

Indicator 2.a – Area of forestland and net area of forestland available for timber production

Many human populations depend on forests directly or indirectly for a wide range of extractive and non-extractive goods and services. For forests to continue to function, it is necessary to maintain the presence of the forest itself and to understand the levels of goods and services that now come from forests and the levels likely to be sustained. Changes in the productive capacity of forest ecosystems could be a signal of economic hardship, unsound management or unforeseen agents affecting the forest ecosystem, such as acid rain.

This indicator, the area of forest land and its availability for timber production, provides information fundamental to calculating the timber productive capacity of existing forests. It shows how much land is available for timber production compared with the total forest area of a country. The difference between total area and net area demonstrates that some forests are not going to be harvested for a variety of reasons. Figure 3 shows the percent of forest land available for timber production by country, excluding forest land not available for timber production by law, regulation or policy.

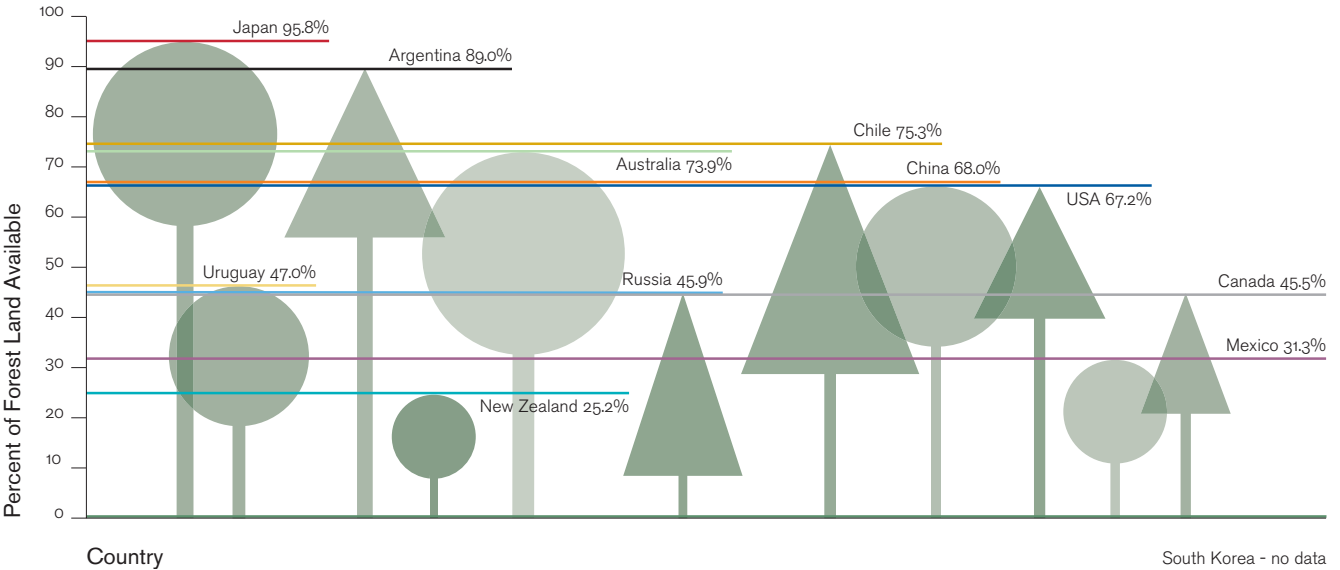
Comments on Data and Data Collection Process

“Available” land under this indicator is understood to mean forest land where wood product extraction is not restricted, e.g. land not in parks or areas removed from harvest for protective purposes, such as municipal watersheds, or lands available only for the production of non-wood goods such as game or decorative plant materials. Private or public lands where owners do not currently plan to harvest would still be considered available for harvest. The data for this indicator include lands that are currently considered unavailable based on economic or technological conditions affecting merchantability.

Observations

In many countries, a majority of the forest land is available for timber management. The percentage of forest area unavailable for timber production largely reflects lands legislated, regulated or otherwise allocated by policy for non-timber uses, such as conservation of biological diversity and recreation (New Zealand and Canada).

Figure 3 – Percent of forestland available for timber production (excluding forestland not available by law, regulation or policy)



Criterion 3

Criterion 3 – Maintenance of Forest Ecosystem Health and Vitality

Indicator 3a – Area and percent of forested area affected by process beyond historic variation

Healthy forest ecosystems are essential to the sustainable management of forests. Forest ecosystem vitality refers to the ability of an ecosystem to perpetuate itself. Ecosystem vitality may be reduced by chronic factors such as pollution, nutrient imbalances, over grazing by animals, or decline in populations of bees or other pollinators.

This indicator describes the area and percent of forested area affected by such processes. It is designed to portray the effects that a variety of processes and agents, both natural and human-induced, are having on basic ecological processes in the forests. These processes or agents include forest land conversion, unsustainable harvesting, changes to natural fire cycles and floods, and the introduction of non-native species, especially pathogens and invasive species. Where ecological processes are altered beyond some critical threshold, they may produce significant permanent changes to the condition of the forest. By periodically examining specific indicators, it may be possible to detect deleterious changes early enough to modify management strategies, thus reversing the unwanted change. Figure 4 shows the extent of wildfire over time by country.

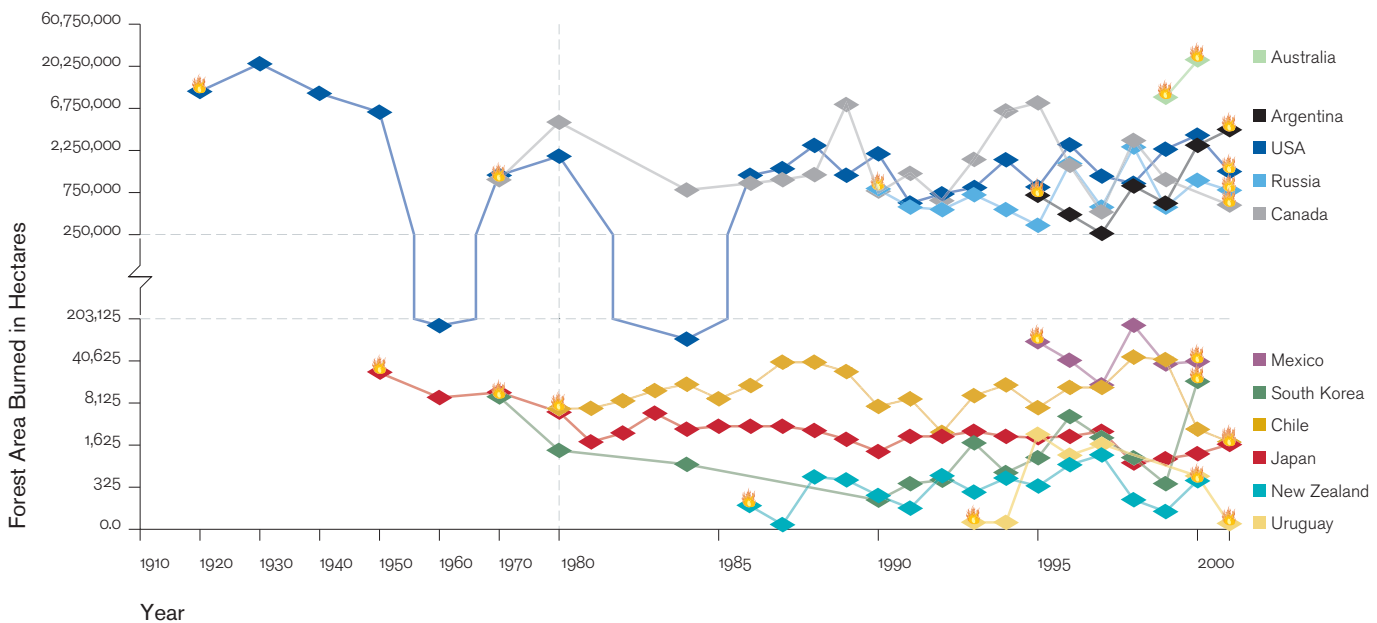
Comments on Data and Data Collection Process

Among the many forest health items that could have been reported on, this Overview Report only illustrates data on fire disturbance. In most countries, there is insufficient data to construct historic fire trends. Therefore, only data for the past 15 years are reported for most countries. The data include natural, planned and unplanned human-caused fire events.

Observations

Countries do not have data on forests affected by wildfire that provide the basis for historical variations. While most countries have data from 1995, some countries have data over a longer period of time. Available fire trend data for the last 15 years reveal that areas subject to fire have remained relatively constant although demonstrating great annual variation within countries. Although historic data in the United States show a dramatic reduction in the area burned since the early 1900s as a result of aggressive fire suppression programs, these same programs have contributed to current ecological and fire problems in the western part of the country.

Figure 4 – Extent of wildfire over time by country



Criterion 4

Criterion 4 – Conservation and Maintenance of Soil and Water Resources

Indicator 4b – Percent of forest land managed primarily for protective functions

Soil and water resources and associated protective and regulatory functions of forests on watersheds are an essential element of sustainable forest management. Chemical, physical and biological characteristics of aquatic systems are excellent indicators of the condition of the forests around them. Conservation of soil and water is also fundamental to sustaining the productive capacity of forest ecosystems and protecting life and property.

This indicator provides a measure of the area and proportion of forest land managed primarily for protective functions. Managing forests should include practices that reduce soil erosion and ensure that the function of the forest in protecting water quality is not diminished. Recording how much land is specifically allocated to soil and water quality protection provides an indication of the extent to which these elements are specifically considered in forest management. Figure 5 shows general trends in the forest land managed primarily for protective functions over the last 20 years.

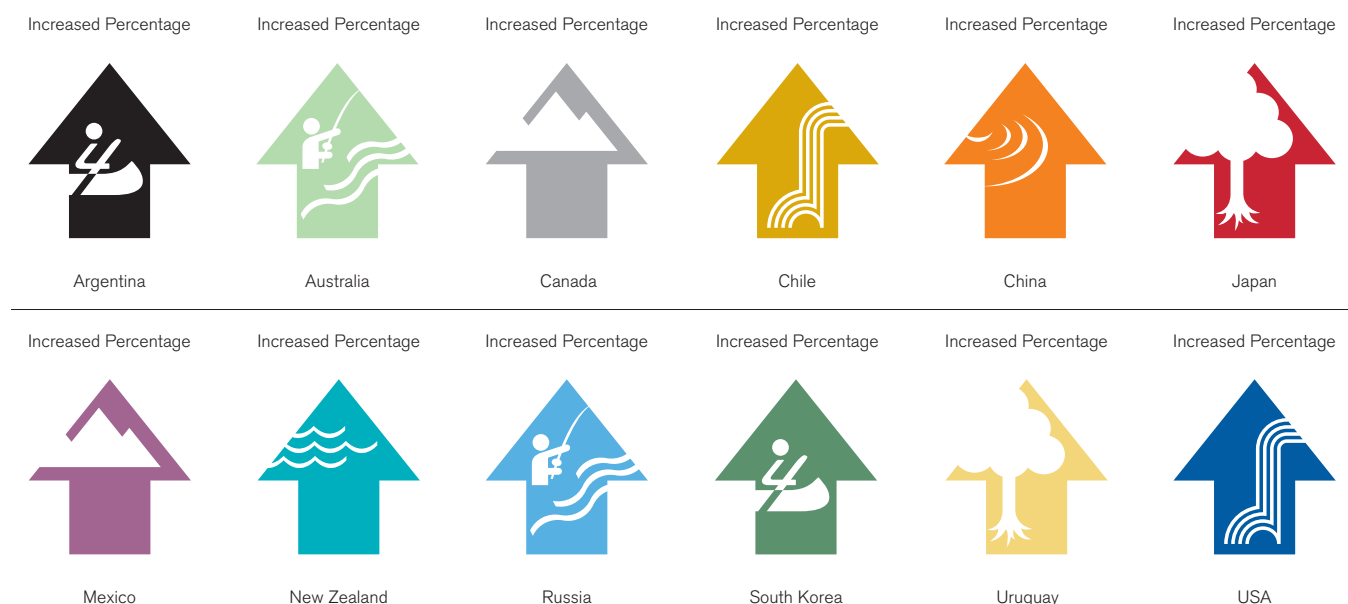
Comments on Data and Data Collection Process

Most countries currently do not have quantitative data on the area of forest managed primarily for the protection of soil, water and riparian function and services. However, many countries have qualitative information that indicates general trends about the percentage of forest land managed primarily for protective functions (e.g. new protected areas, new legislation).

Observations

Soil and water protection is an increasing consideration in developing forest policy and in forest management practices. Countries have laws, policies and various voluntary processes or mechanisms, such as best management practices, designed to protect watersheds, riparian zones, and water concurrent with other activities. In recognizing the importance of soil and water resources, most countries are increasing the percent of forest-land managed to protect soil and water resources. For example, the increase in China's forest area in part reflects the results of Chinese soil stabilization programs. In recognizing the importance of soil and water resources, most countries are increasing the percent of forest land managed to protect soil and water resources.

Figure 5 – Trends in percent of forest land managed primarily for protective functions



Criterion 5

Criterion 5 – Maintenance of Forest Contribution to Global Carbon Cycles

Indicator 5.a – Total forest ecosystem biomass and carbon

Forests have an important role as a source of carbon and as a means to absorb carbon from the earth's atmosphere. This dual function of forests is important because the concentration of atmospheric carbon is a major determinant in how fast the earth's climate may change. Forests absorb carbon from the atmosphere through photosynthesis and return carbon by the respiration of plants, decay of wood and leaves, fire and deforestation. Management of the forests and the use of forest products affect how forests sequester or release carbon into the atmosphere. In addition, forest biomass, a recyclable carbon compound, may be used instead of fossil fuels. In some countries, global changes in climate could result in a reduction of forest area and/or reduced productivity. In other countries, an increase in forest area and their productivity may result from global climate change. In both cases, changes in the earth's forest biodiversity will be a concern.

This indicator, total forest ecosystem biomass and carbon, portrays the total national carbon contained in forest ecosystems within a country. Reports on trends in total carbon in forests are important for developing national strategies to help stabilize global climate change. Global climate in turn is important to national strategies regarding sustainable forest management, since climate change can significantly disturb the ecological

balances that have produced existing types and distribution of forests. Figure 6 shows the above-ground and below-ground carbon stored in forests by country.

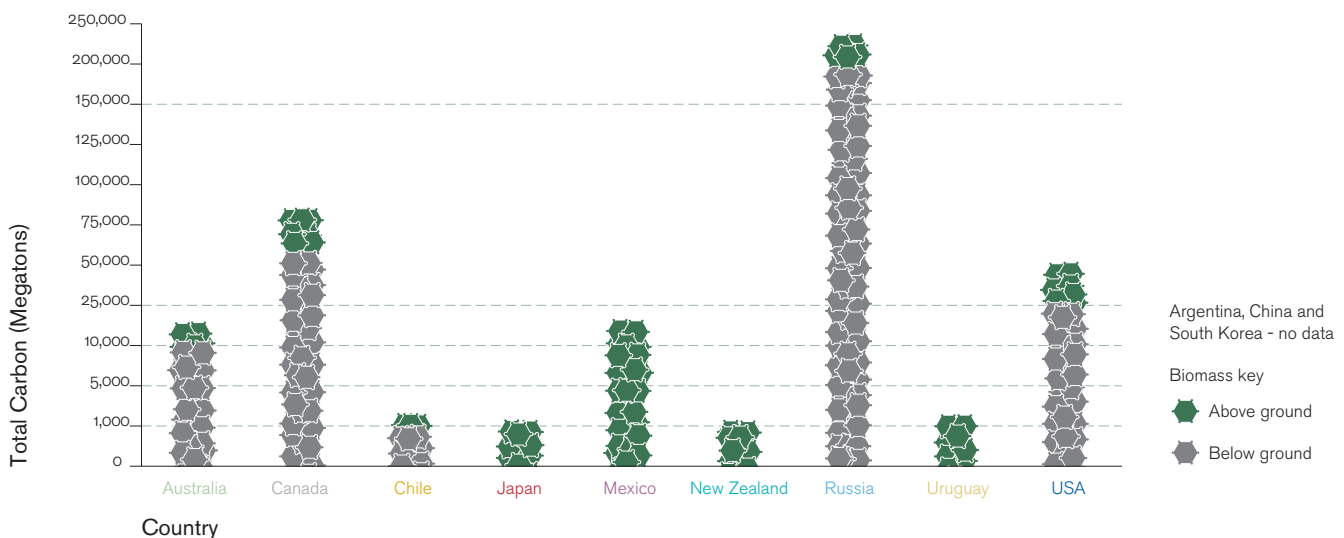
Comments on Data and Data Collection Process

The method of calculating and reporting on carbon is consistent with the methodology used in the Intergovernmental Panel on Climate Change (IPCC). In some northern boreal forest types, the quantity of below-ground carbon may be much greater than the above-ground carbon. In order to make the country data more comparable, total forest carbon is reported as above-ground and below-ground carbon.

Observations

Global terrestrial carbon in vegetation is defined as living and dead organic matter both above and below ground. Soil carbon can comprise a significant portion of forest carbon. Countries with boreal forests, such as Russia and Canada, have proportionally higher amounts of soil carbon than countries with predominantly temperate forests because of the accumulated organic material called peat. There is little carbon trend data currently available but modeling suggests that deforestation, afforestation, reforestation, accumulated growth, and possibly the warming of soils in colder latitudes have a significant effect on total forest carbon.

Figure 6 – Total forest ecosystem carbon pool, above and below ground by country



Criterion 6

Criterion 6 – Maintenance and Enhancement of Long-Term Multiple Socio-Economic Benefits to Meet the Needs of Societies

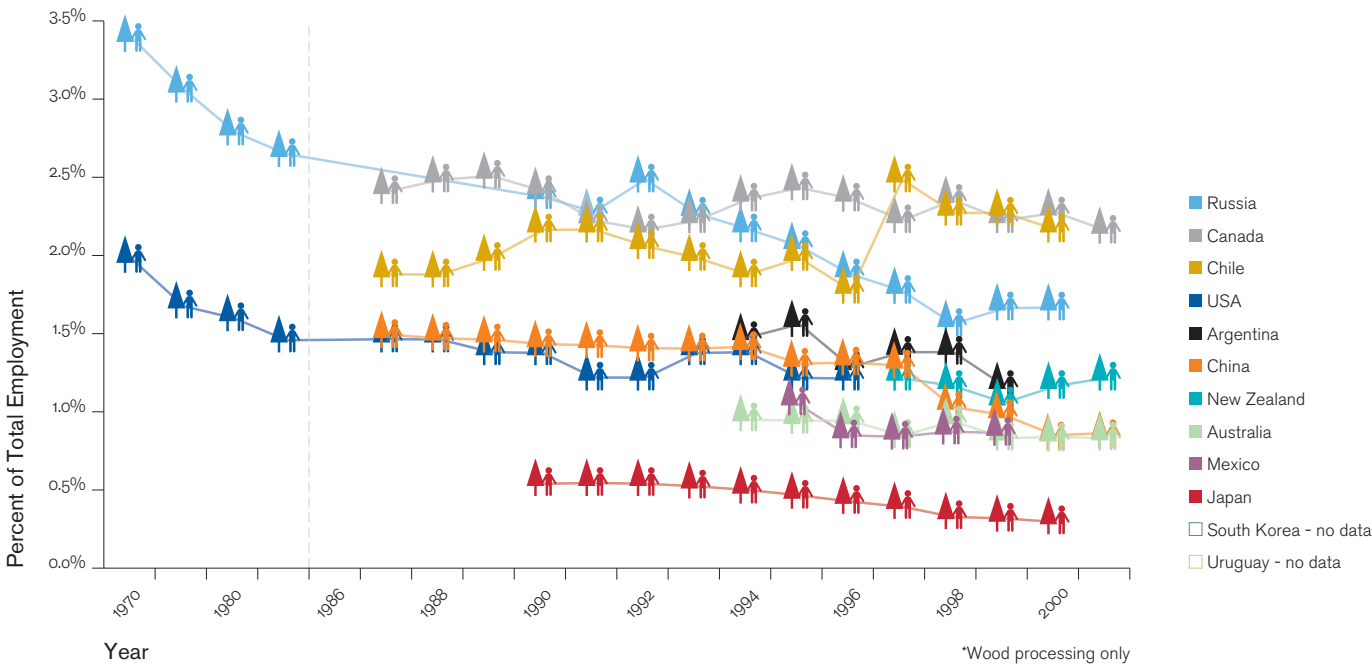
Indicator 6.5a – Direct and indirect employment in the forest sector and forest sector employment as a proportion of total employment

Forest ecosystems are renewable and can be maintained in perpetuity. Proper management regimes enable forests to retain their ecological integrity, biological components, and ability to respond to changing conditions. Historically, society has focused on the management of the forest land base to maximize timber production. However, over the past few decades, forests have been increasingly managed for a wider variety of uses. The

economic and social values of forests influences society's desire to protect, conserve and sustainably manage forests. This indicator, direct and indirect employment in the forest sector as a proportion of a country's total employment, reflects the socio-economic benefits of forests. Direct employment includes employment within or close to the forest, such as logging, saw mills and recreation. Indirect employment reflects work performed outside the forest, such as furniture manufacturing, fertilizer sales and recreation equipment. This indicator is one measure of the size and economic health of the forest products sector.

Figure 7 shows the percentage of a country's total employment contributed by the forest products industry. Because of a lack of data, the figure presents only trends in wood and wood product employment. Nevertheless, the data are useful for comparing employment trends in the wood and wood products industry with national employment trends.

Figure 7 – Direct employment in the wood products sector as a proportion of total employment



Comments on Data and Data Collection Process

The data reflected in Figure 7 represent forest production and primary processing employment which are only a portion of direct employment in the forest sector. In most countries, data for other forest-based employment, such as protection, research, education and management, are not currently available. Some of these data are collected by institutions and agencies outside the forest sector and have not yet been accessed.

Observations

Most data show a small percentage, as well as a slight decline in percent, of people employed in the wood products industry. The exception is New Zealand, which has growing forest related employment due to increased harvesting of its maturing plantations. However, in growing economies, stable forest employment percentages represent an overall increase in the absolute numbers employed in forest production and processing industries. The relative importance of the forest sector in providing for the construction material and fiber needs of society cannot be fully appreciated by looking only at these percentages. Generally, indirect employment in the forest sector is much larger than direct employment, e.g. Australia estimates its indirect employment is three to five times its direct employment.

The data reported in Figure 7 reflect traditionally reported statistics. Higher percentages would be evident if these statistics included indirect forest employment, such as people employed in furniture manufacturing plants, and other direct forest based employment, such as forest recreation. In addition, the data do not reflect forest related employment statistics that are now captured in reports in other sectors, such as tourism and service industries. In the future, countries will seek to include data on a range of direct and indirect forest related employment.

Criterion 7

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

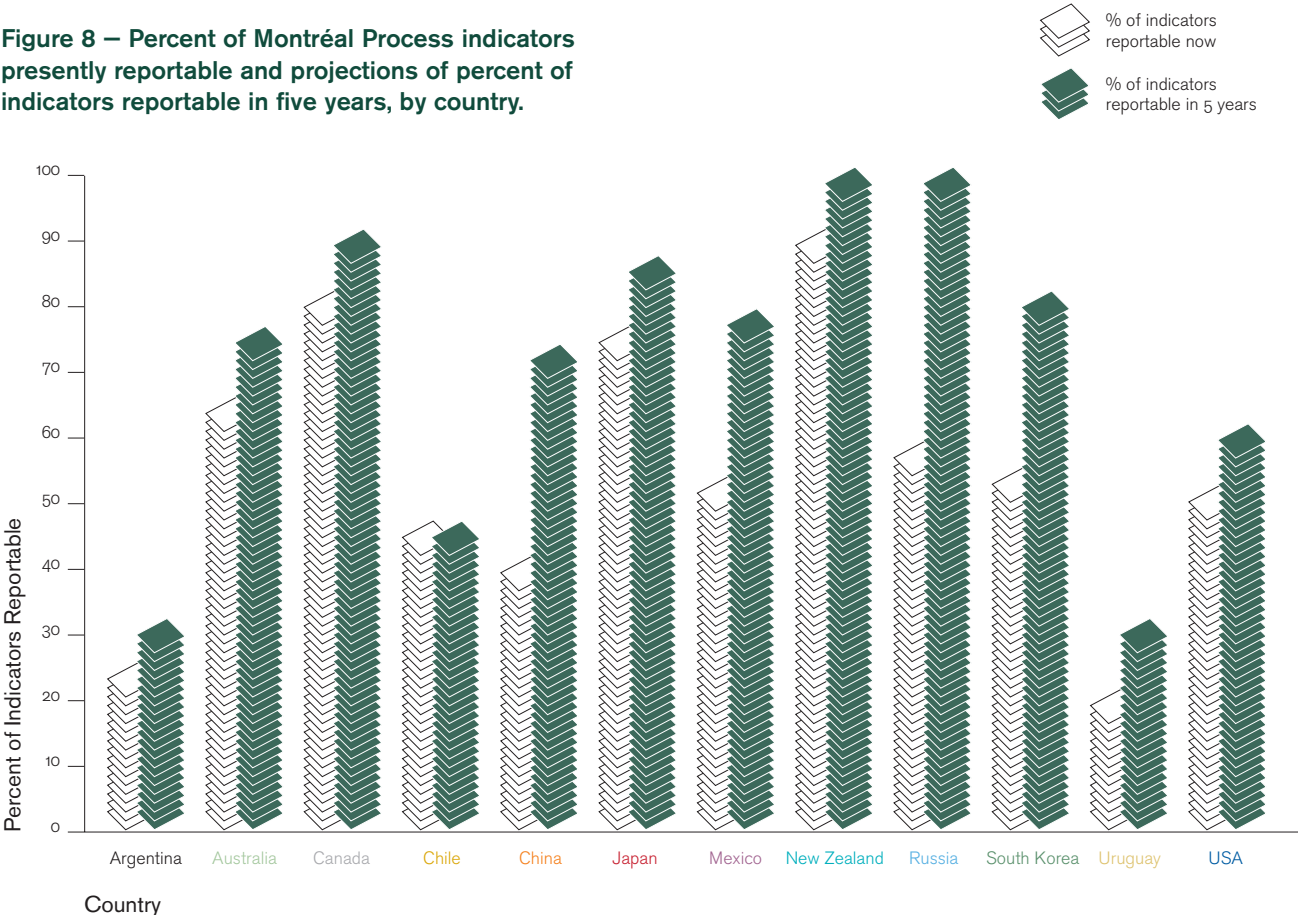
Indicator 7.4.b – Scope, frequency and statistical reliability of forest inventories, assessments, monitoring and other relevant information

Without a strong policy framework, forest conservation and sustainable management cannot become a reality. On the other hand, a strong policy framework can facilitate sustainable forest management. This includes the broader societal conditions and processes often external to the forest itself but which may support efforts to conserve, maintain or enhance the essential forest functions captured in Criteria 1 through 6.

A key aspect of the policy framework is a country's capacity to measure and monitor – in a continuous, reliable and agreed fashion – forest related biological, social and economic conditions. These conditions can then be reported to management and stakeholders. An open and transparent measuring and monitoring system should support the generation of policies and investments promoting sustainability. Public policy decisions should be based on comprehensive, current and sound data.

Figure 8 shows the percentage of the Montréal Process indicators that each country can currently report on and projections for reporting in five years. These percentages are shown because the scope, frequency or statistical reliability of national forest inventories is difficult to present in a simple way for multiple countries. The information in Figure 8 provides an easy read of a country's ability to use available inventory data to report on progress on the sustainable management of its forests.

Figure 8 – Percent of Montréal Process indicators presently reportable and projections of percent of indicators reportable in five years, by country.



Comments on Data and Data Collection Process

Currently, information on most of the indicators reported on is based on data from forest inventories. The data are periodically collected and analyzed by an institution or institutions responsible for reporting on forest statistics for a country. There are two types of inventories: (1) those based on permanent plots, and (2) those based on spatial data. Monitoring refers to repeated measurement through time. Assessment refers to the compilation, analysis and publication of all available data from a range of different data sources to aid decision-making. Forest inventories have traditionally collected forest extent, growth and condition data.

Observations

All 12 countries have inventoried their forests at least once using either spatial-based or plot-based inventories, and all forest area within the countries is covered to a varying degree by those inventories.

All countries have spatial inventories in place and use those inventories for monitoring. Japan, Korea and the United States use plot-based inventories. Other countries are developing permanent sample-based plots for inventory. Plot based inventory systems are common in Europe and are considered potentially more versatile than sample-based systems in collecting a broader spectrum of data.

The frequency and extent of inventories vary according to the characteristics of the forests and the needs of each country. Most inventories are conducted every 5 to 10 years. However, for rapidly changing forests, such as those heavily harvested or affected by accelerating land use change, inventories may need to be conducted more frequently at the sub-national level. Where the rate of change is minimal (such as in northern Canada), inventories are less frequent.

While the current capacity to report on indicators varies among countries, all Montréal Process countries project an increase in their capacity to report on indicators in five years time.

5.0 Conclusions, Observations + Next Steps

A – Data Availability

The results of the Country Forest Reports 2003 reveal that:

- 1 All countries have made progress in generating forest-related information at the national level since the First Approximation Country Reports in 1997.
- 2 Despite the many differences among member countries, most countries show similar forest trends, such as decreased forest conversion to agriculture or urban land, increased regulation to protect forest soils and watersheds, and small decreases in forest employment relative to overall employment.
- 3 The capacity to collect data and report on indicators varies greatly from country to country due to differences in institutional capacity, extent of forest cover, ownership patterns, and levels of economic development. No country is currently able to report on all 67 indicators. Most countries can report on 50 percent or more of the indicators. Three countries can report on 70 percent or more of the indicators.
- 4 A number of the 67 indicators present data collection challenges for all countries for one or more of the following reasons:

Data have not traditionally been collected on the indicator so insufficient national data are available for reporting. Examples include the value and quantities of production of non-wood forest products (Indicator 6.1b), indirect employment (Indicator 6.5a), and the number of visitor days attributed to recreation and tourism in relation to people and forest area (Indicator 6.2c)

Scientific techniques for collecting data that originate at the local or forest management level are uncoordinated or there is no scientific agreement on how to collect the data. This creates data gaps, making it very difficult to aggregate sub-national data for national interpretation. Examples include the level of expenditures on research and development, or education (Indicator 6.3a) or the indicators associated with soil and water conservation (Criterion 4)

There is little or no scientific understanding on how to measure some indicators, although the indicators are known to relate to an important aspect of sustainable forest management. Examples include fragmentation of forest types (Indicator 1.c) and area of land with diminished biological components (Indicator 3.c).

B – Country Progress

Montréal Process countries report that the process of preparing the Country Forest Reports 2003 has motivated them to make significant strides in a number of areas related to implementing the Montréal Process criteria and indicators, among them:

- 1 Using criteria and indicators to improve common understanding of sustainable forest management among stakeholders.
- 2 Involving stakeholders in data collection efforts, facilitating collaboration among stakeholders, and generating stakeholder support for criteria and indicators at national and subnational levels.
- 3 Developing, expanding and coordinating forest inventories and assessments and organizing forest information at national and subnational levels.
- 4 Using criteria and indicators as a framework for objective setting, strategic planning and communicating progress to policy-makers and the public at national and sub-national levels.
- 5 Developing criteria and indicators at relevant sub-national levels and preparing sub-national reports to help forest managers and local communities.
- 6 Linking and developing relationships with other sectors relevant to forests, such as agriculture and environment, and using the Montréal Process criteria and indicators as a basis for developing criteria and indicators for other sectors, such as rangelands and mining.

C – Benefits of the Montréal Process Working Group

All member countries agree that the Montréal Process Working Group has provided a useful international forum for collaborative work among members, for catalyzing national efforts and for facilitating shared views about what constitutes sustainable forest management and how to measure it. The exchange of information, experiences and technical know-how through the Working Group has served to:

- 1 Identify common goals for action (e.g. preparation of the Country Forest Reports 2003 and the First Approximation Report 1997);
- 2 Consolidate technical know-how related to data collection and indicator measurement (e.g. Montréal Process Technical Notes, 1998);
- 3 Foster bilateral cooperation among members, including technical assistance;
- 4 Foster regional collaboration, notably among the Southern Cone member countries (Argentina, Chile and Uruguay);
- 5 Enhance national capacities to report on progress toward sustainable forest management;
- 6 Help countries focus and set priorities for the use of available technical and financial resources for assessment;
- 7 Build confidence and trust among diverse member countries; and
- 8 Clarify international expectations related to sustainable forest management.

D – Outlook Based on Lessons Learned

- 1 The Montréal Process criteria and indicators adopted in 1995 continue to reflect contemporary scientific understanding about the forest ecosystems and the measurement of social and economic values.
- 2 The capacity of member countries to periodically report on forests using the criteria and indicators should improve as national inventories and collaboration among institutions are expanded and improved.
- 3 Periodic monitoring and reporting by countries in the future will increasingly provide the trend data on forests that are needed to help policy makers and forest owners make better decisions about sustainable forest management.

E – Next Steps

Based on A through D above and the experience of preparing the Country Forest Reports 2003, the Montréal Process Working Group and its members will focus on the following actions over the next five years:

- 1 Review, refine and share data inventory protocols to build capacity for reporting, and update the Montréal Process Technical Notes 1998 accordingly.
- 2 Further document the relationship between and applications of national and subnational criteria and indicators and develop extension materials to communicate those applications.
- 3 Review the Montréal Process indicators in light of experience gained in preparing the Country Forest Reports 2003 and the latest developments in science and technology, with a view to refining the indicators as needed.
- 4 Enhance technical collaboration among member countries, including bilaterally and regionally, with a view to improving strategic planning, forest inventories and assessments and forest management at national and sub-national levels.

5.0 Conclusions, Observations + Next Steps *continued*

- 5 Enhance communication and outreach to make the accomplishments and results of the Montréal Process visible and available to stakeholders, other criteria and indicators processes and the international community.
- 6 Explore strategies to help countries mobilize scientific, technical and financial resources to establish cost-effective data collection and reporting strategies using criteria and indicators, including through FAO, ITTO, the Global Environment Facility and bilateral partnerships.
- 7 Continue to urge broad participation of relevant stakeholders within countries as a means of promoting political commitment and mobilizing resources for criteria and indicators and understanding the forest perceptions and needs of different stakeholders.
- 8 Encourage universities and other educational institutions to incorporate in their curricula the latest information on sustainable forest management and skills needed to develop and implement criteria and indicators.
- 9 Encourage national and international institutions to carry out research on indicators difficult to measure, including indicators related to biodiversity, non-timber forest products, soil and water conservation and carbon sequestration.
- 10 Enhance collaboration with other criteria and indicator processes in order to share experiences and know-how, foster capacity building, improve communication and cooperation, and harmonize concepts, terms, definitions and methods for collecting, storing and sharing data.
- 11 Use criteria and indicators as a basis for national reporting on progress toward sustainable forest management to international forest-related fora (e.g. FAO's Global Forest Resources Assessment, UNFF, Convention on Biological Diversity (CBD), UN Convention to Combat Desertification (UNCCD)).
- 12 Seek endorsement by FAO, ITTO and UNFF of a global set of criteria drawn from the national-level criteria elaborated by existing regional and international criteria and indicators processes. A global set of criteria would provide a global framework for the efforts of existing processes, improve communication and coordination among processes and their member countries, and facilitate international cooperation on criteria and indicators.
- 13 Promote awareness, nationally and internationally, of the potential application of forest criteria and indicators to other sectors (e.g. water, rangelands, agriculture, mining) and to international initiatives on indicators for sustainable development (e.g. in the UN Commission on Sustainable Development (CSD), CBD, UNCCD and the Organization for Economic Cooperation and Development (OECD)).
- 14 Encourage other temperate and boreal forest countries to become members of the Montréal Process Working Group.

Annexes + Weblinks

Annex 1

Montréal Process First Forest Overview Report 2003
and Country Forest Reports

http://www.mpci.org/rep-pub/2003/contents_e.html

Annex 2

Criteria and Indicators for Conservation and Sustainable
Management of Temperate and Boreal Forests

http://www.mpci.org/rep-pub/1999/ci_e.html

Annex 3

Montréal Process Publications

http://www.mpci.org/meetings_e.html#publications



Montréal Process
First Forest Overview Report 2003
www.mpci.org