

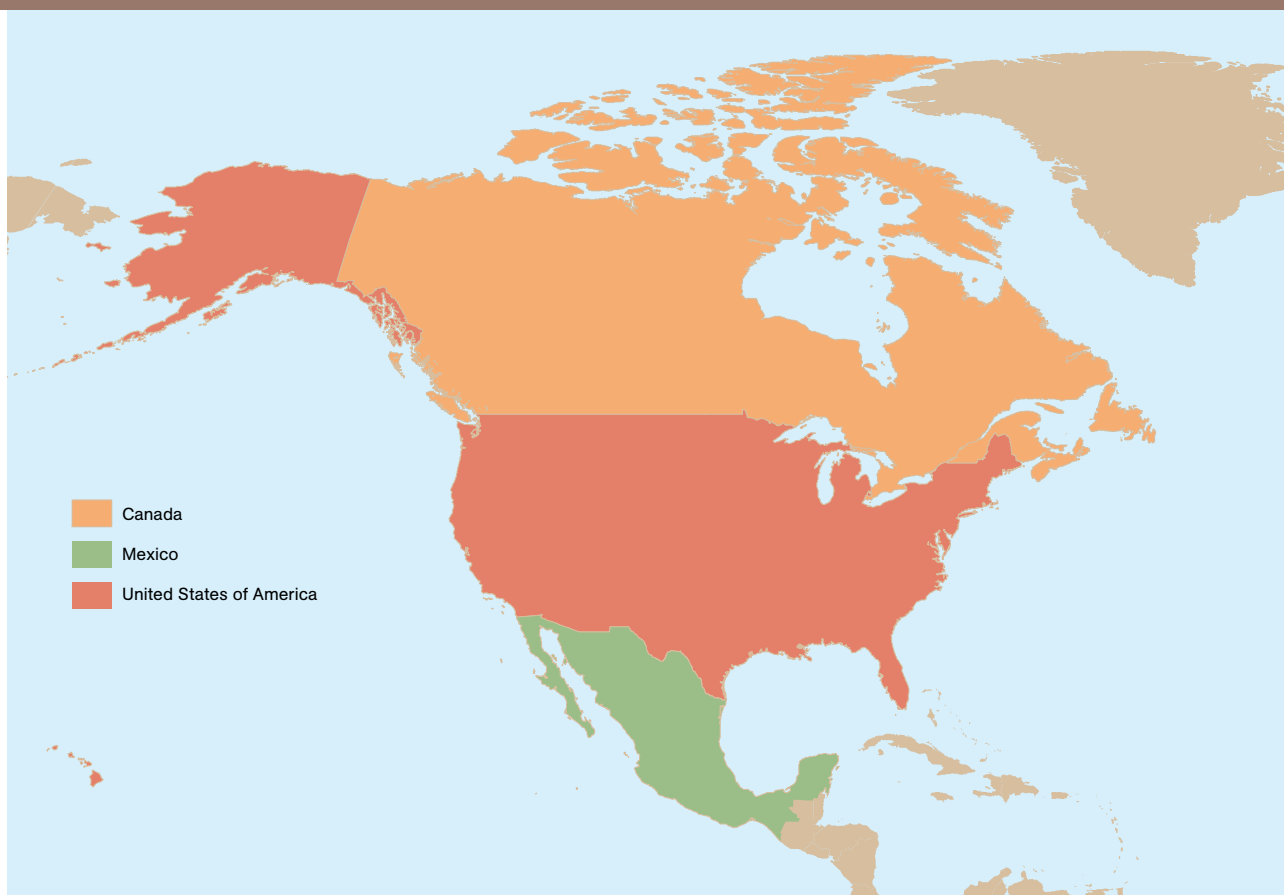


FIGURE 53 | Subregional breakdown used in this report

For purposes of this report, North America includes Canada, Mexico and the United States of America (excluding United States territories in the Caribbean).

North America

EXTENT OF FOREST RESOURCES

Forests cover 33 percent of North America's land area (Figure 54) and account for 17 percent of global forest area. The world lost about 3 percent of its forest area from 1990 to 2005; but in North America, total forest area remained virtually constant (Table 33 and Figure 55). Canada reported no change in forest area from 1990 to 2005; Mexico reported a decrease of 0.52 percent per year from 1990 to 2000, which slowed to a decrease of 0.40 percent per year from 2000 to 2005. The United States of America reported an annual increase in forest area of 0.12 percent in the 1990s and 0.05 percent from 2000 to 2005.

Forest plantations, which represent about 4 percent of total forest area globally, account for 5.6 percent of forest

area in the United States of America and 1.6 percent in Mexico (Table 34). Canada was not able to report on this parameter in the context of FRA 2000 or FRA 2005.

The extent of forests in North America is fairly stable, which is especially significant when compared with the world as a whole. The continuing loss of forest cover in Mexico remains a concern, although the percentage rate is less than in many other countries. For example, Mexico's neighbour Guatemala is losing forest area at a rate more than three times that of Mexico.

Forest plantations make up an increasing proportion of total forest area in some parts of the world. For example, China alone has four times the area of planted forests of the United States of America (FAO, 2006i). The absence

TABLE 33

Extent and change of forest area

Subregion	Area (1 000 ha)			Annual change (1 000 ha)		Annual change rate (%)	
	1990	2000	2005	1990–2000	2000–2005	1990–2000	2000–2005
Canada	310 134	310 134	310 134	0	0	0	0
Mexico	69 016	65 540	64 238	–348	–260	–0.52	–0.40
United States of America	298 648	302 294	303 089	365	159	0.12	0.05
Total North America	677 798	677 968	677 461	17	–101	0	–0.01
World	4 077 291	3 988 610	3 952 025	–8 868	–7 317	–0.22	–0.18



SOURCE: FAO, 2001a.

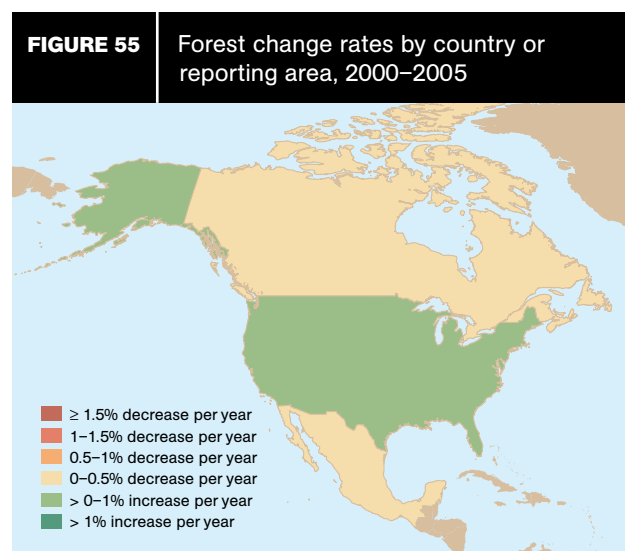


TABLE 34

Area of forest plantations

Subregion	Area (1 000 ha)			Annual change (1 000 ha)	
	1990	2000	2005	1990–2000	2000–2005
Canada	–	–	–	–	–
Mexico	–	1 058	1 058	–	0
United States of America	10 305	16 274	17 061	597	157
Total North America	10 305	17 332	18 119	–	157
World	101 234	125 525	139 466	2 424	2 788

NOTE: The North America total figures only refer to the country (ies) that have reported on this variable.

of information about forest plantations in Canada makes it difficult to draw conclusions about this particular parameter for North America as a whole.

BIOLOGICAL DIVERSITY

Primary forests account for 45 percent of the forests in the region, with more than half the total found in Canada. These forests are stable in Canada, declining at an annual rate of 1.1 percent in Mexico and declining slightly in the United States of America. In contrast, at the global level, primary forests are declining at an annual rate of about 0.6 percent.

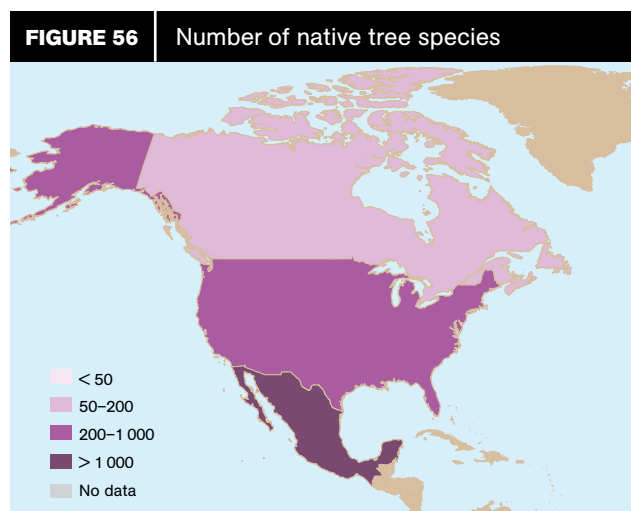
Some 12 percent of North America's forest area is designated for conservation, compared with a global

average of 11 percent. Forest area designated for conservation increased in the United States of America at an annual rate of 3.7 percent from 2000 to 2005, with Canada reporting no change and Mexico reporting an annual decrease of 0.2 percent (Table 35). At the regional level, the annual increase of 2.7 percent exceeds the global average increase of 1.8 percent.

Other indicators of biological diversity include the number of tree species per country (Figure 56) and the number of tree species considered to be endangered or vulnerable. In general, the diversity of all species, including tree species, increases with proximity to the equator.

It is not possible to make sweeping conclusions about trends based on this information; there is little evidence that forest biological diversity in the region is either substantially decreasing or increasing.

Within the region, Mexico is the area of greatest concern, as it is experiencing significant losses in its primary forests. At the global level, tropical and dryland forest ecosystems are under the greatest pressure, and Mexico has significant forest area in both of these categories.

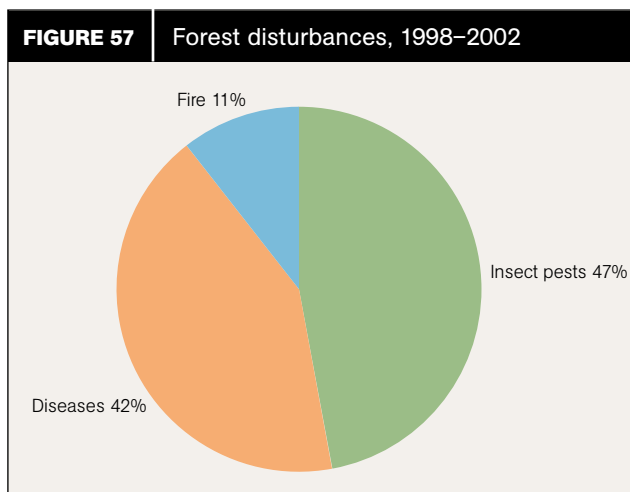
**FOREST HEALTH AND VITALITY**

In the region as a whole, insects account for the highest proportion of disturbances in terms of forest area, followed by diseases and then forest fires (Figure 57). On average, over 40 million hectares of forest are disturbed each year by insects, disease or fire, or about 6 percent of the total forest area in the region.

TABLE 35

Area of forest designated primarily for conservation

Subregion	Area (1 000 ha)			Annual change (1 000 ha)	
	1990	2000	2005	1990–2000	2000–2005
Canada	15 284	15 284	15 284	0	0
Mexico	4 513	4 425	4 381	–9	–9
United States of America	49 948	50 675	60 076	73	1 880
Total North America	69 745	70 384	79 741	64	1 871
World	298 424	361 092	394 283	6 267	6 638



North American forests have long been subjected to pressure by both indigenous and exotic pest outbreaks, affecting trade and ecosystem functions and increasing fire and safety hazards. Introduced insect pests include the Asian longhorn beetle, *Anoplophora glabripennis*, and the emerald ash borer, *Agrilus planipennis*. Examples of diseases include sudden oak death, *Phytophthora ramorum*, and Eucalyptus rust, *Puccinia psidii*, a recent arrival in Hawaii, United States of America. Naturally occurring forest insect pests include the mountain pine beetle, *Dendroctonus ponderosae*, and the southern pine beetle, *Dendroctonus frontalis* – the most destructive insect pest of pine forests in the southern United States of America and in parts of Mexico (Payne, 1980).

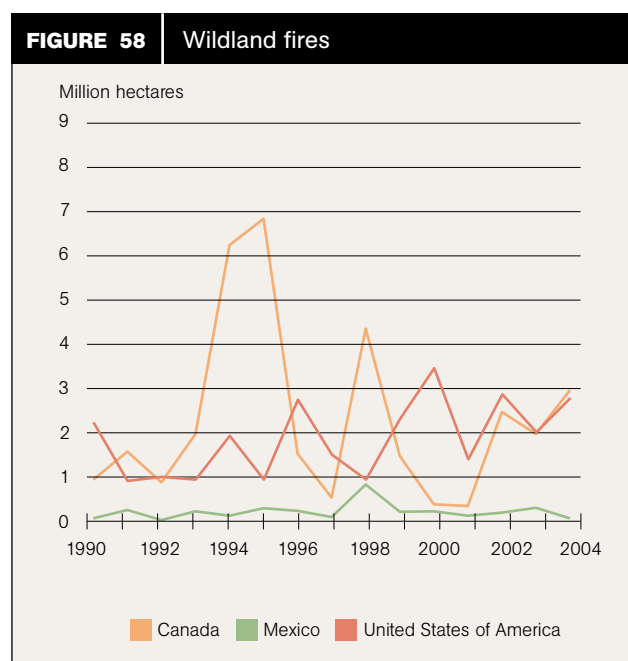
The detection of the emerald ash borer in southeastern Michigan, United States of America, in 2002 has focused attention on invasive species entering the region, becoming established and remaining undetected for some time. This exotic beetle probably arrived in the United States of America on solid wood packing material from its native Asia. It subsequently became established in the central United States of America and Canada, where it has killed more than 20 million ash trees and contributed to regulatory changes and enforced quarantine. The cost to municipalities, property owners, nursery operators and forest products industries has run into tens of millions of dollars. Measures have been taken to store viable seed source so that the ash tree population can be re-established in the event that the borer cannot be contained.

It is not only exotic invasive pests that cause significant management challenges. At times, managing outbreaks of indigenous pests is as much of a challenge as managing some exotics. The extent and intensity of such outbreaks can be affected by other types of disturbances such as fire, extreme weather events or human activity. An example is the recent outbreak of the naturally occurring mountain pine beetle in Canada. In 2005 it was estimated

that, since 1997, this outbreak had affected from 7 to 8.5 million hectares of forest. It was predicted that, by the end of 2006, approximately 40 percent of the susceptible pine would have been killed or harvested. In previous outbreaks, mountain pine beetles have killed as many as 80 million trees distributed over 450 000 ha, making them the second most important natural disturbance agent after fire in these forests. The Government of British Columbia has dramatically increased logging in an attempt to slow the spread of the beetle by removing recently infested trees and to recover value from trees already killed. To handle increased harvest allowances, the forest industry has increased its capacity to process the wood. The environmental and social implications of this epidemic are under surveillance.

Forest fires have a major impact on forest health in all three North American countries, and in recent years fire management has been one of the major preoccupations of forest leaders. All three countries have observed long-term increases in the severity of fires and in losses from catastrophic fires (Figure 58). The three countries regularly share information and resources in an effort to prevent and manage forest fires.

Dramatic swings from year to year are an indication of the effect of changes in climate: severe fire seasons are often followed by relatively mild seasons. This variability poses severe management challenges for agencies planning budgets and human resources without knowing the severity of the next fire season. Programmes to prevent unwanted fires and to manage the beneficial aspects of fire are becoming more sophisticated and more costly. Fire plays an important role in many forest ecosystems in the



SOURCE: FAO, 2006d.

region, particularly boreal forests, and prescribed fire is an important, although risky, forest management tool.

North America has several regional mechanisms for promoting cooperation on forest health issues. The working groups for forest insects and disease and for forest fire management are the longest established groups of the North American Forest Commission (NAFC), each having been established over 40 years ago. Recently, a new working group on invasive species has been added. In addition, the North American Plant Protection Organization, recognized under the IPPC, offers mechanisms for regional coordination on phytosanitary matters, including those for reporting on pests and activating alerts, as well as providing fact sheets.

PRODUCTIVE FUNCTIONS OF FOREST RESOURCES

The production of wood and non-wood products is very important in the region, with a major impact on the social and economic dimensions of sustainable development. About 6 percent of forest land is designated primarily for production, compared with 32 percent at the global level. However, this is a misleading statistic, as it is not

a common practice of North American countries to use the designation “production forest” as it is in Europe, for example. In North America, it is much more common to designate forest area for “multiple purpose”, including production and protection. Some 79 percent of North America’s forests are so designated, compared with 34 percent of the world’s forests (Figure 59).

Growing stock is increasing (Table 36), but Mexico did not report on this variable.

Wood removals provide another perspective on forest productivity, with all three countries reporting data for the three reporting years. Removals continue to decline in Mexico and the United States of America, and to increase in Canada (Figure 60). The net result is a decline at the regional level in the 1990s and a slight increase from 2000 to 2005.

There was a sharp decline in the 1990s in the use of fuelwood in Canada and the United States of America, although this trend has levelled off since 2000. It has continued to increase in Mexico since 1990. Moreover, it is likely to increase in all countries in the future if the price of fossil fuels continues to rise, providing an incentive to use wood and other renewable energy sources.

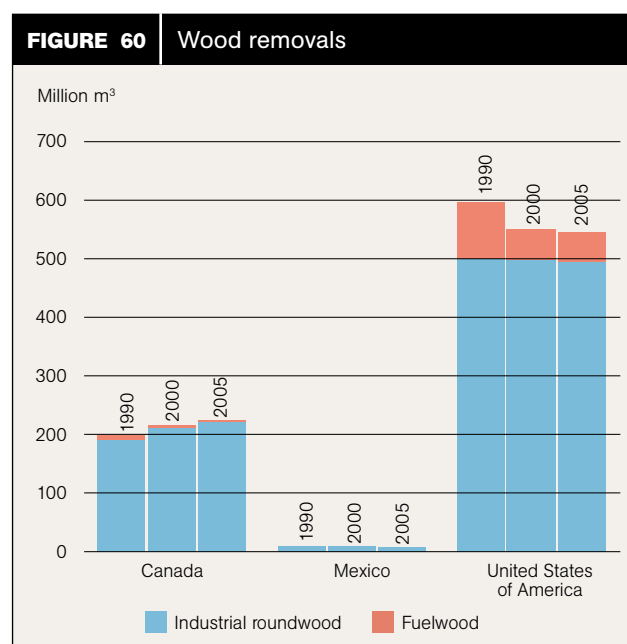
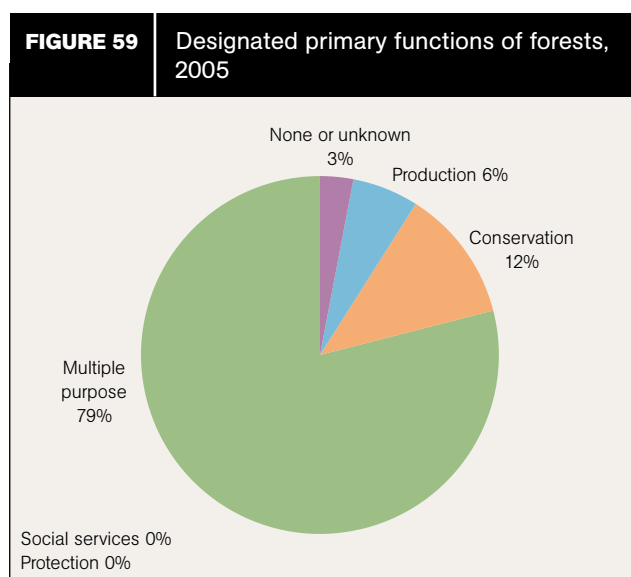


TABLE 36

Growing stock

Subregion	Growing stock					
	(million m³)			(m³/ha)		
	1990	2000	2005	1990	2000	2005
Canada	32 983	32 983	32 983	106	106	106
Mexico	–	–	–	–	–	–
United States of America	32 172	34 068	35 118	108	113	116
Total North America	65 155	67 051	68 101	107	109	111
World	445 252	439 000	434 219	109	110	110

NOTE: The North America total figures only refer to the country (ies) that have reported on this variable.

North America accounts for 40 percent of the world's wood removals and only 17 percent of the world's forest area, suggesting that the region's forests are relatively productive and the use of forests for commercial purposes is relatively well advanced.

Only 7 percent of the wood removed in North America is used for fuel, compared with a global average of 40 percent. In contrast, in Africa, fuelwood accounts for almost 90 percent of wood removals.

The information available on NWFPs at the regional level is not sufficient to draw conclusions or to identify trends. However, there is evidence that the use of forests for a variety of such products is increasing in many parts of the region.

PROTECTIVE FUNCTIONS OF FOREST RESOURCES

As mentioned in the previous section, in North America, a majority of the forest area is designated as multiple purpose, including production and protection (Figure 59). None of the countries uses the category "forest designated primarily for protection", and only Mexico reported any protective forest plantations.

Mexico is one of the world leaders in an emerging area of innovative public policy – payment for environmental services. As of 2005, over 500 000 ha of forest in Mexico were covered by schemes to pay forest owners for the benefits of good forest management, providing clean water and mitigating climate change.

Although the protective functions of forests are well known, and these values seem to be increasingly recognized and discussed in the popular media as well as in government and academic circles, there is a shortage

of macrolevel information to suggest whether trends are up or down at the regional level. This is an area requiring more applied research.

SOCIO-ECONOMIC FUNCTIONS

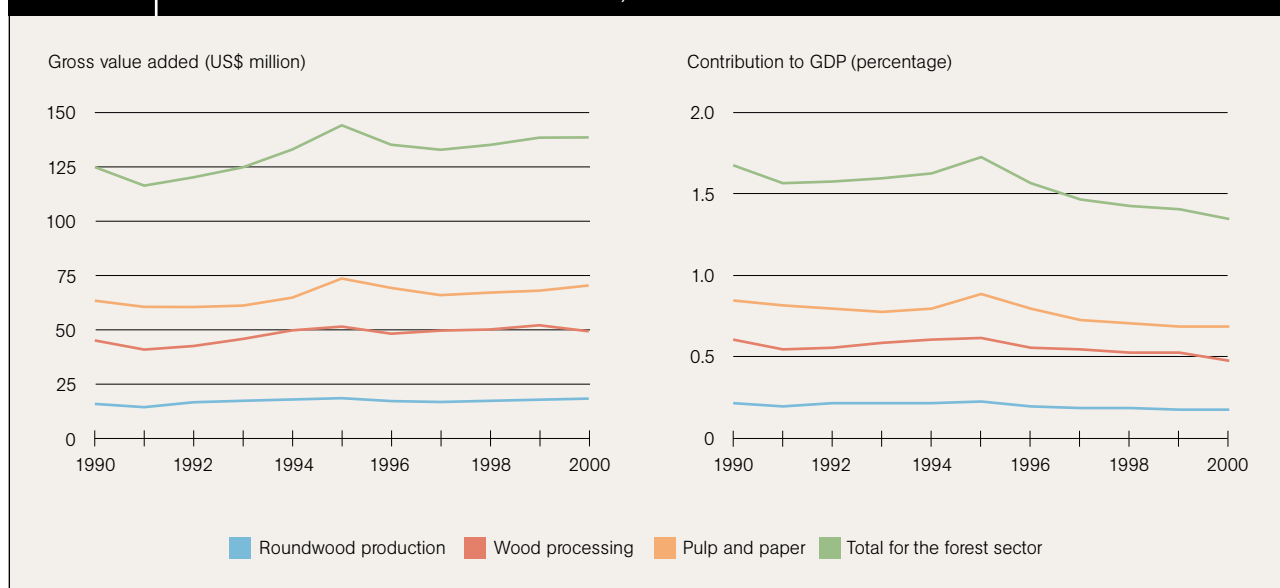
The value added by forest products to national economies in the 1990s was generally upward, peaking in 1995 when prices for wood products were strong (Figure 61). However, the contribution of forests to GDP declined during the same period, mainly owing to the strengthening of other economic sectors.

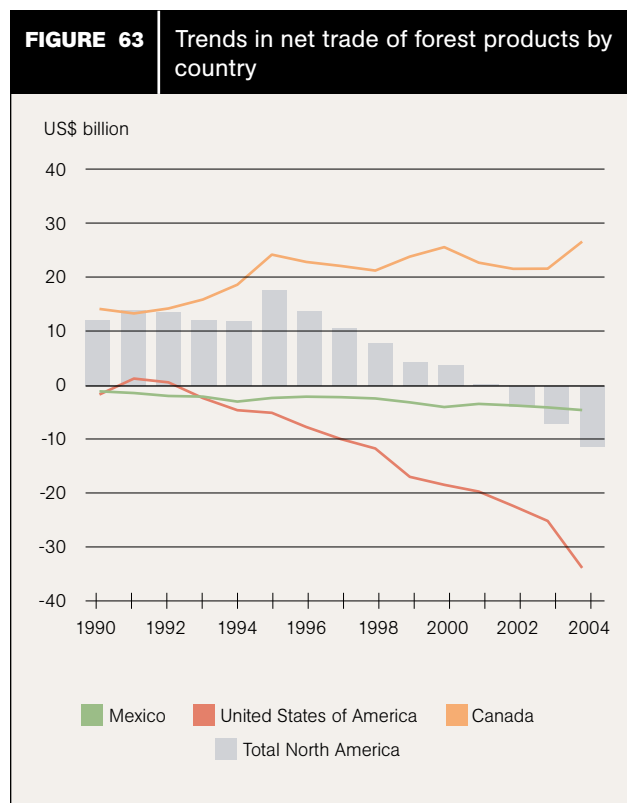
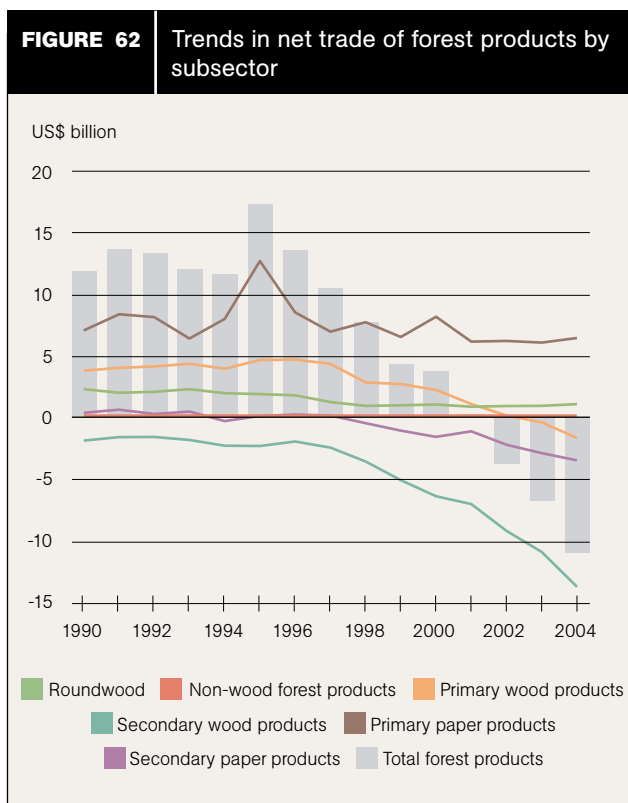
Forest products are especially important in Canada's economy, contributing 12 percent of total export value in 2004 (compared with 3.4 percent in the United States of America and 1.3 percent in Mexico), although this is down from 15.5 percent as recently as 1990.

The most startling trend in trade of forest products is the dramatic increase in imports into the United States of America and, to a lesser extent, into Mexico and Canada. Canadian and Mexican exports continue to increase, while United States exports grew in the 1990s and have declined slightly since 2000. For the region as a whole, which was a strong net exporter in the 1990s, forest products imports are increasing far more rapidly than exports, and the region is now a net importer (Figure 62).

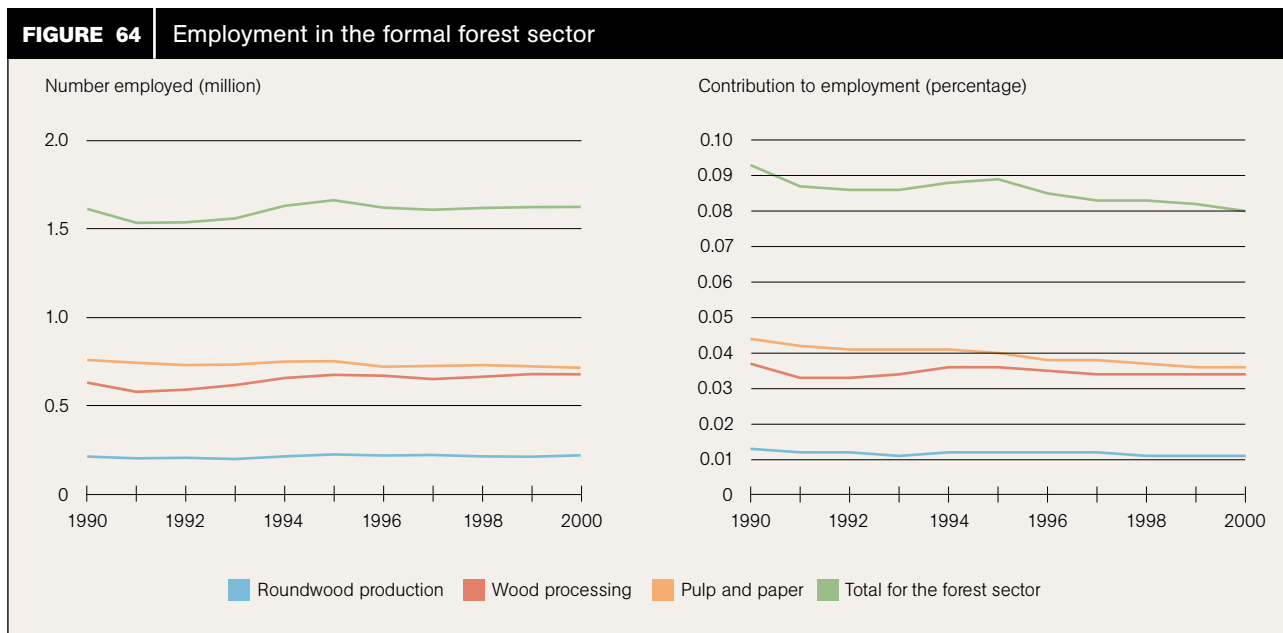
The United States of America, which was a net exporter until 15 years ago, is increasingly a net importer. The main reason for the trend is not a decline in exports, which are fairly stable, but the increase in imports, which grew from US\$22 billion in 1990 to US\$62 billion in 2004 (Figure 63). Today the value of forest products imports is more than double the value of exports – a trend driven primarily by secondary forest products. The trend

FIGURE 61 Trends in value added in the forest sector, 1990–2000





NOTE: A positive value indicates net export. A negative value indicates net import.



coincides with a huge increase in the export of secondary wood products (furniture, etc.) from China and other countries with large trade surpluses.

Employment in the forest sector rose slightly in the early 1990s and has been fairly stable since (Figure 64), although the forest sector's share of total employment in the region has shown a long-term decline.

The forest sector is important in all three countries. The total value of forest products is greater in North America than in any other region, in the area of US\$140 billion per year. However, production, trade and employment from North America's forests have remained essentially flat, and the relative importance of the sector is declining as other sectors exhibit faster rates of growth.

Wood removals are declining in Mexico and the United States of America, while they continue to increase in Canada. This trend is reflected in economic data, with modest growth in several economic indicators in Canada and a slight decline in the other two.

The data in this section do not reflect recreational uses of forests. FAO does not systematically collect data on this dimension, but the economic impact is significant. For example, the Forest Service of the United States Department of Agriculture (USDA) estimated that the outdoor recreation programme in national forests contributed US\$11.2 billion to the United States national economy in 2002 (USDA, 2006).

LEGAL, POLICY AND INSTITUTIONAL FRAMEWORK

For a country to achieve sustainable forest management, it must have a supportive legal, policy and institutional framework. In this respect, the North American region clearly has a solid foundation. All three countries have progressive policies that promote a mixture of private enterprise and public controls, decentralization within a stable national framework, clearly designated access rights to forest resources, and functioning forest research and educational institutions.

In Mexico, the only country in the region currently experiencing deforestation at the national level, the most serious problems do not appear to be related to institutional failures. On the contrary, Mexico has recently made changes that are already showing major benefits, such as the new forest law and the establishment of the National Forest Commission. The country is struggling to develop its economy, and it is sometimes easy to forget that Canada and the United States of America also experienced significant deforestation during periods of rapid population and economic growth. For example, forest area in the United States of America today is estimated at 28 percent less than it was at the time of European settlement. Most of the loss occurred during the period of rapid westward expansion from 1850 to 1900.

The institutional framework for forest management is significantly different in each of the three countries, resulting in large part from diverse ownership patterns. In Canada, 92 percent of the forests are publicly owned, almost all under the responsibility of the provinces. In Mexico, 59 percent of the forests are public, while, in the United States of America, public forests account for 42 percent of the total. What sets Mexico apart from its northern neighbours is the nature of its public forests, which are mainly in the form of *ejidos*. These are forests that are managed and whose benefits are shared by local communities. Mexico is one of the world's most advanced models of community forest management.

In sum, the underlying framework reflects a strong political commitment to achieve sustainable forest management in all three countries.

SUMMARY OF PROGRESS TOWARDS SUSTAINABLE FOREST MANAGEMENT

With respect to most of the thematic elements, North America is making more progress than most other regions, especially those with a high proportion of developing countries or countries with economies in transition.

All three countries of the region are particularly concerned about forest health, and they have undertaken collaboration to address transboundary issues in this area. Working groups under the North American Forest Commission address fire, invasive species, and forest insects and disease at the regional level.

There is an obvious inverse correlation between economic development and deforestation. It is not surprising that Mexico, with the lowest per capita GDP in North America, is the only country in the region struggling with deforestation. At the other economic extreme, the United States of America is facing the problem of a declining forest industry, as indicated by weak employment and a rapidly increasing trade deficit in wood and paper products.

Sustainable forest management would seem to be an attainable goal in North America.