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Organización
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NORTH AMERICAN FOREST COMMISSION

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THE OUTLOOK FOR FORESTS AND FORESTRY IN NORTH AMERICA

The State of the World's Forests 2009 (SOFO 2009) will include a summary report on the outlook for the forestry sectors in each of six different regions of the world, as well as the global outlook. In the case of the other regions, FAO has conducted comprehensive studies in recent years resulting in forestry sector outlook studies. These are available on the FAO internet site:

<http://www.fao.org/forestry/site/outlook/en/>

For North America, the NAFC Bureau of Alternates agreed in 2007 that each member country would prepare a country outlook report. The three country reports served as the basis for a regional report prepared by FAO and attached to this document (available in English and French).

The members of the Commission are invited to review and comment on the Draft report, *The Outlook for Forest and Forestry in North America*. The report was circulated to member countries in May 2008.

Following the incorporation of suggestions made by the Commission, the report will be finalized by FAO and included in SOFO 2009.

This document is printed in limited numbers to minimize the environmental impact of FAO's processes and contribute to climate neutrality. Delegates and observers are kindly requested to bring their copies to meetings and to avoid asking for additional copies. Most FAO meeting documents are available on the Internet at www.fao.org

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**THE OUTLOOK FOR FORESTS AND FORESTRY
IN NORTH AMERICA**

FAO Forestry Department

Prepared 13 May 2008

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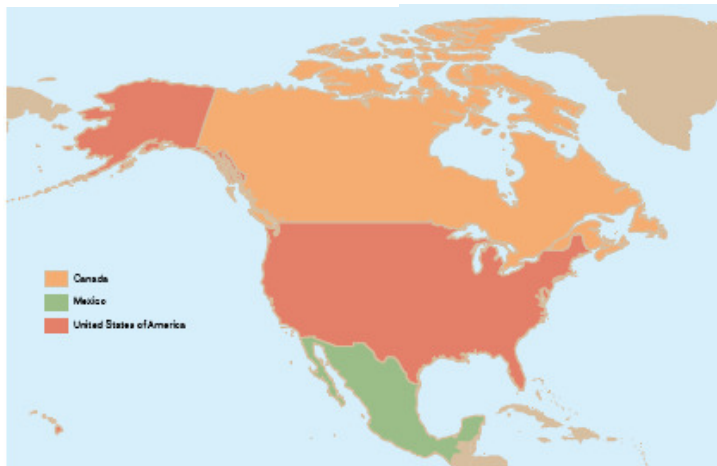
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THE OUTLOOK FOR FORESTS AND FORESTRY IN NORTH AMERICA

INTRODUCTION

The North American region consists of three large countries: Canada, Mexico, and the United States of America. It has 7 percent of the world’s population, 16 percent of the land area and 17 percent of the world’s forest area (677 million hectares). About one-third of the land area of all three countries is forested. The highly varied climatic conditions have led to a remarkable diversity in forest ecosystems, ranging from humid tropical forests in southern Mexico to boreal forests in Northern

Figure 1: Subregional Breakdown



Canada and Alaska. Some of the world’s most productive forests are found in this region. The differing history of development has led to important social, economic and institutional differences, all of which are reflected directly and indirectly in the forest situation.

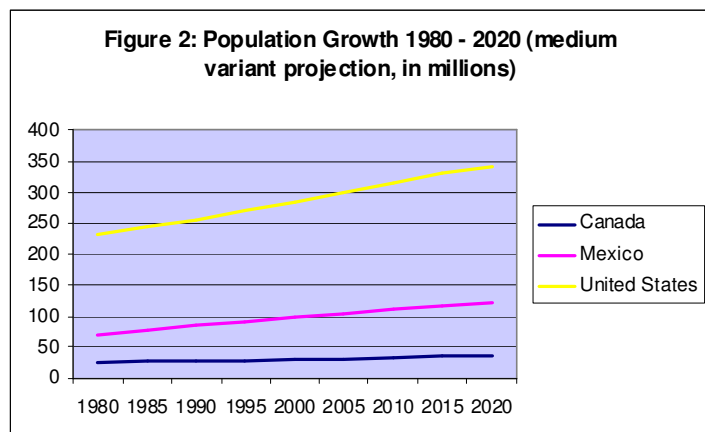
Canada and the United States are advanced industrial economies while Mexico is still in transition to an industrialized country. The

overall state of development has important impacts on the forestry sector. This chapter provides an overview of the key drivers of change, the emerging scenarios and the long term outlook for the forestry sector in the region.

Table 1: North America’s Key Features:	
Political/Economic	Forest Situation
<ul style="list-style-type: none"> • High income and declining dependence on land as a source of income; • Well developed political and institutional environment and a high level of public awareness; • Open economies responsive to changing market environment and globalization; • Increasing integration of the economies through NAFTA; • High level of investments in science and technology and consequently in the forefront of innovation. 	<ul style="list-style-type: none"> • High per capita land and forest area in comparison with other regions; • Relative stability of forest area (except for Mexico); • Well developed public, private and community organizations supporting forestry; • Increasing demand for environmental services, especially forest recreation; • Global leadership in production and trade of forest products.

DRIVERS OF CHANGE

As elsewhere developments in the forestry sector in North America are strongly influenced by largely external factors and by developments outside the region, including the many impacts of globalization.



Demographic changes

Demographic changes affect forests and forestry directly and indirectly. North America's population is expected to increase from about 436 million in 2005 to 500 million in 2020. Current population growth rates vary from 0.9 percent in Canada and the USA (with immigration as a major

factor) to 1.5 percent in Mexico. While Mexican population growth is also declining, work-related migration to the United States is a key demographic feature of Mexico, also representing a major source of income through remittances (and with the consequent impact of reducing the land pressure). Deceleration of growth in the US economy, particularly resulting in the decline of the construction industry is affecting remittances (see Box 1) and this may have an impact on the Mexican rural economy and land use.

Another important demographic feature of North America is the relatively low population density of about 21 persons/ km² (varying from less than 4/ km² in Canada to about 55/ km² in Mexico). North America has nearly 80 percent of the population living in urban areas, and this trend toward urbanization is expected to continue, especially in Mexico. Some of the other important demographic characteristics that are impacting the forestry sector include:

- Aging of the population in Canada and USA, which may constrain availability of skilled and unskilled workers for forestry, especially in view of the availability of less arduous work in the industrial and service sectors.
- Although immigration is helping to overcome some of the problems related to labour shortage, this is unlikely to help the forestry sector, as most immigrants tend to take up employment in urban areas.
- Increasing disconnectedness between people and nature as more people reside in urban centres, although the ageing population is more likely to take advantage of urban forests. As

well, do to rising awareness, society as a whole is increasingly demanding environmental services (especially for recreational activities), and this is being viewed as important for the next generation (see Box 2).

Box 2: US Forest Service- Reuniting Children with Nature

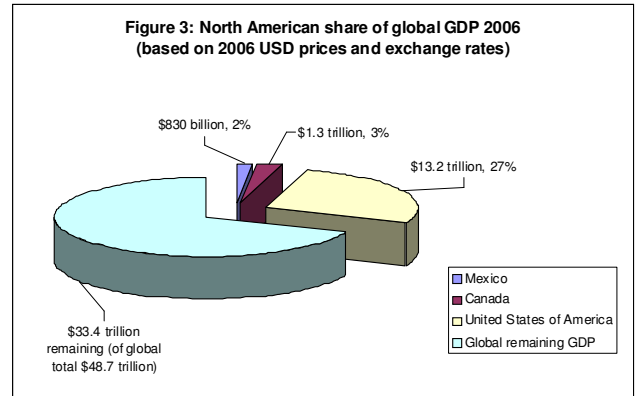
Concerned that technology savvy American youth are lacking the important emotional, psychological and physical benefits of outdoor recreation, the American Forest Service Chief has unveiled a new project called "More Kids in the Woods". Designed to bring urban youth to forests for hands-on experiences, the scheme is also considered essential for educating the next generation on the principles of sustainable forests and healthy public lands- potentially stimulating career paths in natural resource and land management as well as an overall appreciation of the benefits of a healthy environment that will remain into adulthood.

Economic changes

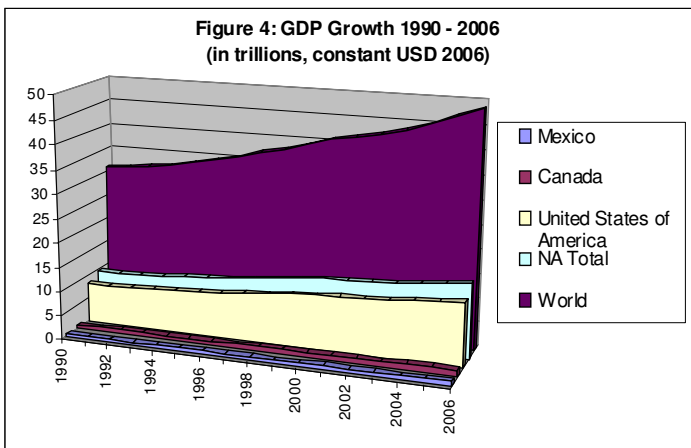
Growth of income

Since the region consists of two highly developed economies (Canada and United States) and a middle income country (Mexico), economic pressures on forests are less severe than in most other regions.

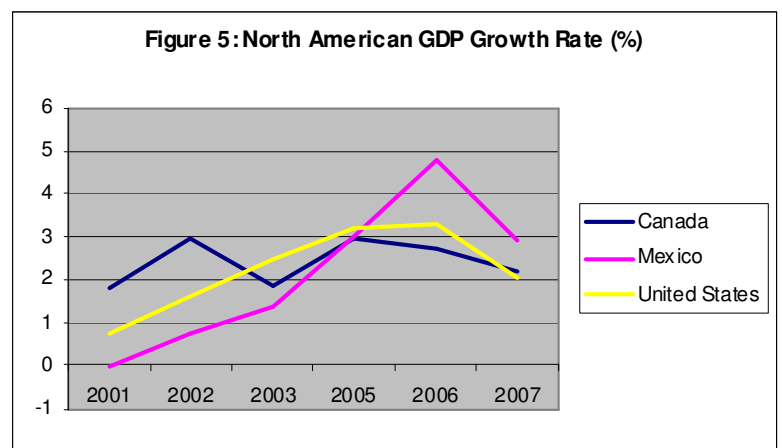
The region accounted for about 32 percent of the global GDP in 2006, although this share is on the decline in view of the much faster growth of other economies. All three countries have seen significant economic fluctuations in the past few years (see Figure 5). While GDP in the USA and Canada has been growing at rates varying from 2 – 3 percent, the Mexican economy registered higher growth rates, albeit from a relatively low income level.



The recession in the US economy in the last two years is a major concern. There is considerable uncertainty about how long the recession will last and how deep it will be. A down-turn in the US economy – short or long – will have a contagious effect on the Canadian and Mexican economies in view of the strong dependency, especially in the context of the North America Free



Trade Agreement (NAFTA).



Poverty

Poverty (particularly within the context of highly unequal distribution) remains an important issue in the region, especially in Mexico, but also to a lesser degree in Canada and the USA. Although significant progress has been made, about 28 percent of the rural population in Mexico is reported to be affected by extreme poverty (World Bank, 2005), and this has important implications on natural resource use including forests.

Structural changes in the economies

Structural change in the Canadian and US economies some decades ago significantly reduced the share of agriculture in income and employment. Currently agriculture accounts for less than 1 percent of the gross domestic product in Canada and the USA. Mexico is in the transformation phase; rapid growth of non-agricultural sectors has led to a continuous decline in the relative share of agriculture in the national income, from 25 percent in 1970 to 7 percent in 1980 and to 3.9 percent in 2006. Yet agriculture remains important for employment, absorbing over 18 percent of the work force.

While there has been a rapid growth of commercial agriculture, there is still a large segment of subsistence agriculture in Mexico. This is particularly so with the preponderance of the traditional system of “ejidos” and other community arrangements for natural resource management. Land use changes in Mexico will largely depend on what happens to subsistence agriculture. Import liberalization under NAFTA (especially with all restrictions being lifted from January 2008) will have significant impacts on Mexican agriculture - both the subsistence and commercial segments – affecting forests and forestry both directly and indirectly.

Impacts of globalization

North America is one of the most globalized regions in the world with a high level of inflow and outflow of capital, labour and technology. Important challenges and opportunities relating to globalization in the North American economies are outlined below:

- Both the USA and Canada have substantial natural and human resources and have been in the forefront of innovations, enhancing their global competitiveness (the USA topped the Global Competitiveness Index for 2007-08, Canada ranked at 13th and Mexico at 52nd of the 131 countries measured). As new players emerge in the global economic scene, the viability of some sectors will be challenged. Increasing competition from low cost producers (especially China) and the compulsion to off-shore/ out-source production to remain competitive are bringing about major changes in some of the sectors, including forestry (see Box 3).
- Mexico’s export-focused industrialisation coincides with the rapid industrialization of large Asian economies, especially China, enhancing competition for its products in the domestic and global markets. Mexico’s focus on US markets – which absorbs over 80 percent of all its exports - makes it particularly vulnerable to competition on account of the

Box 3: Impact of globalization on the US forestry sector

- About one out of six US pulp and paper mills have closed since the mid 1990s;
- One out of every three jobs at the US pulp and paper mills have been eliminated since the early 1990s because of consolidation, cost-cutting and productivity improvements;
- 20 North Carolina furniture plants have been closed since 2002;
- The number of major softwood sawmills in the United States declined from 850 to 700 in 2004 alone;
- In one decade (from 1990 to 2000) the percentage of US sales of wood household furniture imports, primarily from China, increased from 20% to more than 50% and continue to expand.
- Since 1990, imports of softwood lumber increased from 27% of consumption (12 billion board feet) to 38% (25 billion board feet).
- Imports of oriented strand board (OSB) increased from 1.3 billion ft² (19 percent of consumption) in 1990 to 8.5 billion ft² (39 percent of consumption) in 2002.

increasing share of Chinese exports of similar products to the US markets.

Policy and institutional development

Overall, North America has a well-developed democratic system at all levels – local, national and regional. Public sector institutions including in forestry are very well developed and have continuously adapted to the larger economic and social changes. All three countries have followed liberal economic policies and consequently the private sector plays a key role in all economic activities. One characteristic feature of private sector development is the dominance of large trans-national corporations in all sectors; another is continuous innovation due to competition, which has also led to consolidation through mergers and acquisitions.

Within the forestry sector, dynamic institutional change is particularly evident in the divestment of woodlands under the control of large forest companies and the emergence of Timber Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REIT), which have been able to mobilise funds for buying forest land for short and long term investments. TIMOS are also expanding their investments in other countries, notably Latin America, Asia and Europe.

Another dimension of institutional development is the increasing role of community-based organizations, especially focusing on the rights of indigenous communities. This has particular relevance to natural resource management including forestry. Canada has built an effective mechanism for involving First Nations in resource management and there are several examples of sustainable management of forests by aboriginal people (see Box 4).

Mexico has a long history of community management of natural resources under the “Ejidos”, although the efficacy of these is extremely variable, reflecting the differences in the overall capacity of the community institutions. Policies promoting privatization and changes in the rural economy (in particular changes in agriculture and migration) are modernizing the “ejidos”.

Box 4: Aboriginal partnerships in Canadian forestry sector

- The forest industry has become one of the most important commercial sectors for aboriginal people;
- The forest products industry directly and indirectly employs more than 17,000 aboriginal people and does business with more than 1400 aboriginal firms;
- About 1000 forestry operations are owned by aboriginal people.
- Aboriginal forest workers are still concentrated in lower-skilled, part-time and seasonal positions.

Source: Natural Resources Canada, 2007.

The highly favourable democratic environment has contributed to the emergence of vibrant and effective civil society organizations advocating policy changes in forestry and other areas, including compliance of social and environmental responsibility by the corporate sector. In almost all debates relating to land use changes, civil society organizations play a critical role, and in USA and Canada there is an effective consultative process to incorporate diverse perceptions for public decision-making. The radical reduction in public timber supply from national forests in the USA in the 1990s was due almost entirely to political action initiated by civil society

organizations through the legal system, resulting in the transformation of the forestry sector in Western states. For civil society organizations in Mexico, conditions are not yet as favourable.

Environmental issues

Awareness about global, national and local environmental issues is very high, and society as a whole is paying increasing attention to issues such as climate change, biodiversity loss, water resources and land degradation and desertification. Some of the key factors that contribute to a greater emphasis on environmental services include:

- Significant reduction in land dependency (with the exception of Mexico) and hence the low opportunity costs for the provision of environmental services;
- High levels of awareness, translating into an array of policies and regulations providing a robust framework for environmental protection related to water, air and biodiversity. Especially in Canada and the United States, a host of institutions – public, private, community and civil society – are involved in environment related issues. Complex political processes have developed for determining the trade-offs between competing objectives and interests.
- Increased income, improvements in transportation and changing perceptions and values have fueled a long-term increase in the use of forests for recreation. This has led to a variety of arrangements – like conservation easements – that protect unique ecosystems from alternative uses that could impair the provision of environmental services.

The situation in Mexico is slightly different in that it is still an economy in transition with a relatively high level of dependence on land as a source of income and hence a higher opportunity cost for conservation. While Mexico is one of the most biodiverse countries, being relatively poor also implies a high level of pressure on account of illegal logging and conversion of forests to agriculture.

Climate change remains the most important of the environmental issues on account of its short and long term consequences on forests. In the short term, climate change (especially prolonged drought) in combination with other factors- such as policies relating to forest fire management resulting in more combustible material and declining resources - have exacerbated the fire problem. All the countries have seen an increasing intensity and frequency of forest fires. Similarly there has been an increase in pest infestation, as in the case of Mountain Pine Beetle (see Box 5). A recent study indicates that this infestation is releasing more carbon than forest fires, notwithstanding the salvage logging and carbon fixation in the wood products (Brown, 2008).

Box 5: The Mountain Pine Beetle infestation in British Columbia

Currently spreading through western Canada, the mountain pine beetle infestation is immense: it is estimated to have killed over 530 million m³ of lodge pole pine trees in British Columbia by 2007. Over 8.7 million hectares are currently infested; many more are expected to be killed by 2018. The infestation is projected to eventually kill 78% of all lodge pole pine stands in British Columbia (1,000 million cubic metres of timber) by 2018 when the infestation will finish, largely because there will be no more suitable forest area to move to. The epidemic is now threatening different pine species, including the jack pine of the northern boreal forest, and it has spread south into the US Rocky Mountain region. The beetle is native to region, but its range has spread northward and to higher elevations with milder winters. Temperatures below -40C several nights in a row will kill the larvae, but such cold snaps have become rare in recent years.

Technological changes

Well-established science and technology institutions and strong investments both by the public and private sectors have made the region a global leader in innovation. The USA in particular has played a leading role in information and communication technologies, space exploration and remote sensing, biotechnology and nanotechnology. Increasing fossil fuel prices coupled with the concern about foreign dependency as well as climate change have led to an enormous increase in investments in the search for new energy technologies, including the second and third generation biofuel technologies. This favourable situation has permeated into the forestry sector, providing substantial headway in all the critical areas including wood production, transport and processing. Although Mexico is somewhat behind the other two countries in science and technology investments, it does benefit from investment-linked transfer of technologies, including in agriculture and forestry.

However, the technology lead enjoyed by the USA is declining, at least in a relative sense, on account of increasing efforts in other regions, especially Europe and Asia. The Task Force on the Future of American Innovation has identified a number of worrying trends that are reducing the competitive edge of the United States (Task Force on the Future of American Innovation, 2005) in a number of critical areas (see Box 6).

Box 6: The future of American innovation

- As other nations commit significant resources to science and engineering education, the share of worldwide undergraduate S&E degrees has dropped. Further the proportion of US citizens in science and engineering graduate studies within the US is declining and in 2001 approximately 57 percent of all S&E postdoctoral positions at the US universities are being held by foreign born scholars.
- Since 1980, the number of S&E positions in the US has grown at almost 5 times the rate of the US civilian workforce as a whole, while the number of S&E degrees earned by US citizens is growing at a much smaller rate. Increasing global competition in the global S&E market is encouraging a reversal of the flow of highly qualified persons.
- World's fastest growing economies are increasing their R&D investments and are on track to catch up with the US R&D investments. Further federal funding of basic research in engineering has experienced little or no growth over the last three decades.
- The US share of worldwide high-tech exports has been in a 20-year decline. From 1980 until 2001 the US share fell from 31 percent to 18 percent, while the global share of China, South Korea and other emerging economies increased from 7 percent to 25 percent.

Source: The Task Force on the Future of American Innovation, 2005.

A major change in R&D investments is the shift from the public sector to the private sector, affecting the balance between basic and strategic research and development, and adaptive research. Global competitiveness of the forestry sector may be adversely affected if the current trend of declining public sector research support continues.

An overview of plausible future scenarios

Although the North American region is in a relatively healthy situation on account of favourable demographic, political, institutional and technological situations, there are several key uncertainties in the short and long term. The most important uncertainty relates to the current economic recession. While business cycles are normal in all market economies, there is some concern that this may be deeper and longer, partly reflecting economic shifts arising from the emergence of Asian economies.

- Persistent stagnation of the US economy will have a significant impact on all the sectors, including forests regionally and globally. *Prolonged inflation and economic stagnation → vicious cycle of reduced demand, low investments and declining incomes → reduction in consumer spending and reduction in profitability in most sectors.*

Continued growth of more competitive emerging economies, especially in Asia, is already shifting the global economic balance. Public debt crisis, also resulting in a heavy decline in public and private spending, may further affect employment and income. *Increasing competition and the continued tendency of the private sector to off-shore/ out-source production → increase the anti-globalization sentiments → a review of some of the regional and global trade agreements.* This will have important implications on the ability of the region to access markets outside the region. The overall decline would imply reduced public sector funding in key sectors and continued pressure to privatise the provision of services.

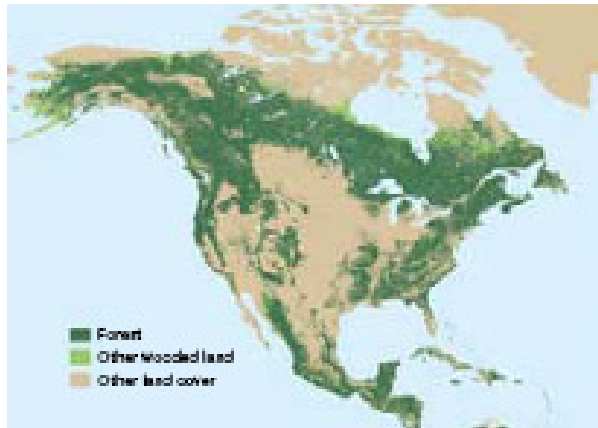
- The alternative scenario assumes that the current crisis will be short-lived and the United States (and the region as a whole) will, as in the past, be able to recover quickly by bringing about appropriate changes in its economic policies including oversight mechanisms. *Continued growth of income → boost demand for all products. Increased investments in innovation → accelerate the pace of transition of the region to a knowledge-intensive economy.*

Taking advantage of the opportunities, Mexico may transform into a fully industrialised society, modernising all its sectors and fully addressing problems like poverty. The region will continue to benefit from the globalization process, strengthening its linkages with other regions.

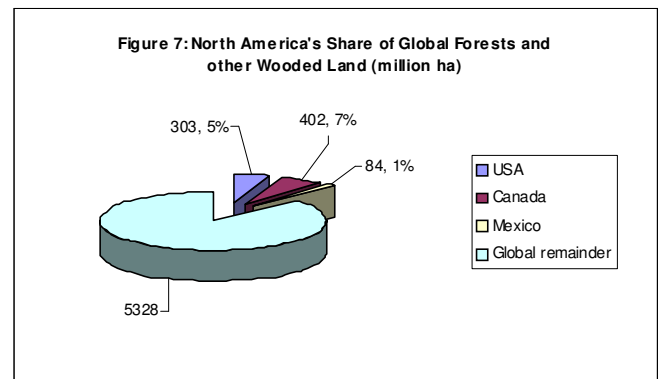
These two divergent scenarios will have differing implications on the forestry sector as discussed in the following sections.

FORESTRY: CURRENT STATUS AND OUTLOOK

Figure 6: Extent of Forest Resources



Forest area change



The North American region has a total forest area of about 677 million hectares, accounting for 17 percent of the global forest area. Table 2 below provides the change in the extent of forest cover in each of the countries.

Table 2: Forest cover change in the North America region

Country/ Region	Area (in 000 ha)			Annual change (in 000 ha)		Annual change (In %)	
	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
North America	677 798	677 968	677,461	17	-101	0	-0.01
World	4 077 291	3 988 610	3 952 610	-8868	-7317	-0.22	-0.18

On the whole the forest cover in the region is stable and accounts for only about 1 percent of the reduction in the global forest area, entirely due to deforestation in Mexico. However, even in the case of Mexico, there has been a reduction in the rate of deforestation since 2000. Most deforestation in Mexico is the product of agricultural expansion (for pasture or cropland), as well as logging (often illegal), particularly around expanding urban centres.

The outlook for forest area change

The forest area in the region is expected to remain relatively stable, excepting for some decline in the case of Mexico. The emerging situation can be described as below:

- In the case of United States and Canada, forest area has remained stable since the beginning of the 20th century. Agriculture expansion and forest clearance in some states have been compensated by abandonment of agriculture and consequent regrowth of forests (see Box 7).

Box 7: Regional shifts in agriculture and its impact on forests

The experience of the state of Maine is a dramatic example of the impact of land use change on forests. Almost 100 percent forested at the time of European settlement, by the end of the 19th century Maine was about 90 percent farmland. Now it is once again almost 90 percent forested. As American farming has shifted to states with warmer climates, longer growing seasons, and where agriculture could more easily be mechanized, trees have returned and Maine is the most forested state in the USA.

Overall, the cyclical changes in the economic situation are unlikely to affect the forest cover situation on a long term basis. Some slight changes do however take place in the forest area in the private domain, especially in the context of ownership changes and consequent land use changes, especially for urban development. Between 1997 and 2020 about 2 million hectares of forestland are projected to be converted to other uses, including urban and suburban growth. This trend will be partly offset by afforestation and natural reversion of abandoned crop and pasture land to forestland. No major changes are expected in the case of the Canadian situation of the current low/ negligible rate of deforestation (see Box 8).

Box 8: Deforestation in Canada

In Table 2 it can be seen that Canada reported a stable forest area in each of the last three Global Forest Resource Assessments. Information on deforestation in Canada is not precise, with estimates ranging from as low as 54 700 hectares per year to as high as 805 00 ha per year during the period from 1990 to 2005. Even the low estimate of annual deforestation is not offset by current afforestation efforts. However, even at the higher rate, the deforestation rate is not statistically very significant; it would take 40 year for Canada to lose 1 percent of its forest area.

- As Mexico is still in the early stages of transition from an agrarian society to an industrial society, the forest situation is different from the rest of the region. A rapid and uninterrupted transition implies a significant reduction in poverty a concurrent reduction in land dependency, which could bring about stability on the forest front. Higher incomes will also imply improved ability of society (including governments and communities) to invest in conservation and sustainable management of land and forest resources. Yet if the overall economic situation declines on account of the

Box 9: Forest ownership differences in North America

- In the case of Canada 93% of the forests are under public ownership with the remaining 7% under private ownership;
- In the USA about 60 percent of forest lands are in private ownership; public forests are dominant in the West while private forests are dominant in the East.
- In Mexico, 59% of forests are owned by *Ejidors and other*, traditional community organizations.

recession in the United States, the transition will be stalled with significant impacts on forests with a drop in the ability of government and local communities to support sustainable forest management.

Forest management

Differences in forest management in the region largely reflect the differences in forest ownership, often determined by historical conditions (see Box 9). Publicly owned forests in all the countries are under intense pressure to satisfy a wide array of demand and generally follow multiple use management, whose effectiveness varies depending on the overall resource situation. Especially in the United States, wood production from the public forests has been scaled down drastically in response to the demand for provision of environmental services. Canada has responded to similar pressures from diverse stakeholders through rigorous efforts to implement sustainable forest management (see Box 10). Accordingly, the CCFM has developed a national Criteria and Indicators framework, which has been used to develop C&I at the provincial and local levels for implementation of sustainable forest management. All these efforts have led to Canada having the world's largest area of third-party certified forests extending over an area of 134 million hectares. More importantly the annual harvest levels have remained below the potential wood supply.

Box 10: National forest strategy of Canada

In 2003, the Canadian Council of Forest Ministers adopted a National Forest Strategy with broad public input, leading to the widespread use of national certification standards and monitoring. The application of the strategy varies across Canada based on local social, environmental and economic circumstances and is driven by the common vision: *“The long term health of Canada’s forests will be maintained and enhanced, for the benefit of all living things and for the social, cultural, environmental and economic well-being of all Canadians now and in the future”*

In contrast to the relatively stable situation of the publicly managed forests, industry managed forests (which dominates wood production in the USA) have seen important changes in response to fluctuating market conditions. Large-scale divestiture of landholdings by forest industry companies, have resulted in millions of hectares of forest land changes hands, to timber investment management organizations (TIMOs), real estate investment trusts (REITs), families, and others. This has led to increasing ownership fragmentation, a consequent increase in unit cost of management for production and more importantly the absence of long term commitments for sustainable management, including a reduction in forest research by the industry.

Forest management in Mexico is unique on account of the predominance of local community management under the “ejidos” and other community organizations who own an estimated 59 percent of country’s forests. The remaining forests are under private control or national ownership (almost all public forests are set aside for protection with harvesting of timber prohibited). Community forests are regarded as “*propiedad social*” or social property forests, and are owned by about 8,500 communities or “*nucleos agrarios*”. Management by communities is extremely variable (ITTO, 2005) largely depending on the constraints facing the communities (see Box 11). It was assessed that in 2002 only about 28 percent of the ejidos and communities with forests implemented commercial harvesting activities, harvesting only one-seventh of the potential. Some of the more efficient “ejidos” have moved into value addition, especially through production of sawn wood and other products (including furniture, floorings, etc.) and even have managed to focus on niche markets through certification, with several ejidos having

received FSC/ smart-wood certification. There is a wide array of schemes to support community management of forests and the communities could opt for any particular scheme depending on the objective of management. If the user/ owner does not want to use the forests for productive purpose, they can also apply for inclusion of the area for payment for environmental services.

Box 11: Constraints for sustainable forest management in the community controlled forests in Mexico

The ITTO Diagnostic Mission to Mexico has identified a number of constraints in the implementation of sustainable forest management and in achieving the ITTO Objective 2000 as indicated below:

- Inadequate and perverse incentives, which promote other land uses and discourages investments in forestry;
- Internal limitations, especially stemming from limited human and financial resources in the communities;
- Institutional and market barriers which affects the competitiveness of community forestry vis a vis other options.

Source: ITTO, 2005.

Outlook for forest management

The responses of management to the short, medium and long term economic changes will largely depend on the type of ownership. Forests that are under public ownership and focused on timber production – as in the case of Canada -could face particular difficulties as regards investments in management in the context of a decline in markets. Private sector involved in wood production will respond differently through divestiture. If the current economic difficulties persist, the overall situation with regard to forest management could be as indicated in Table 3 below:

Table 3: Probable situation in the case of persistent economic stagnation

Canada	Mexico	United States
<ul style="list-style-type: none"> • Overall decline in wood production on account of significant decline in demand for wood and wood products and closure of industries; • However, the mountain pine beetle infestation is expected to flood the market with softwood for several years. • Reduction in investment in forest management, which could enhance the incidence of fire and pest infestation, especially in the context of climate change. 	<ul style="list-style-type: none"> • Declining demand for timber from managed forests, and consequent inability of community organizations to manage forests; • Increased illegal logging on account of loss of jobs in community enterprises and the weakening of community control. • Expansion of subsistence cultivation and consequent deforestation and degradation. 	<ul style="list-style-type: none"> • Slump in housing demand and consequent scaling down of production and employment in forest industries. • Significant reduction in investment in forest management by private sector and divestiture resulting in fragmentation of privately managed forests and their eventual conversion to other land uses. • Decline in investment in the management of public sector forests.

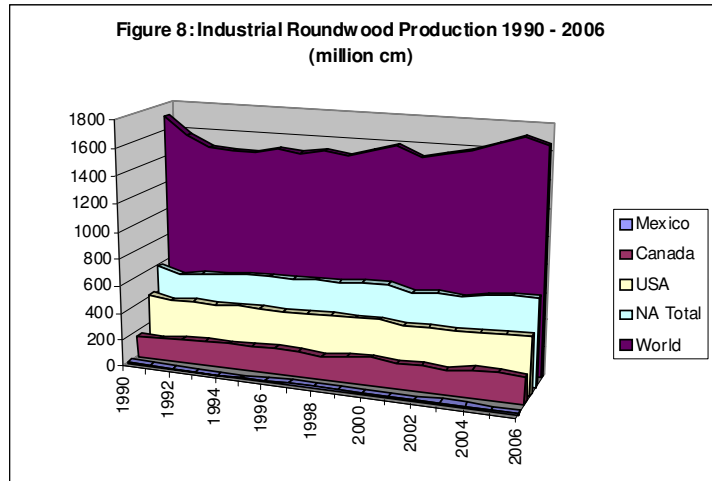
Whether the above situation will improve or not depends on rapid economic recovery and the revival of demand for wood and wood products. At least some of the public forests in Canada managed for timber production are likely to move out of production as industry sheds the over capacity that has been built up hitherto. Industry managed forests in the USA will face particular problems, as more are divested and possibly converted to more attractive short term uses.

Mexico may however be in a better situation, especially on account of the growing domestic demand and the potential to supply low cost wood products to the United States.

Production, trade and consumption of wood and wood products

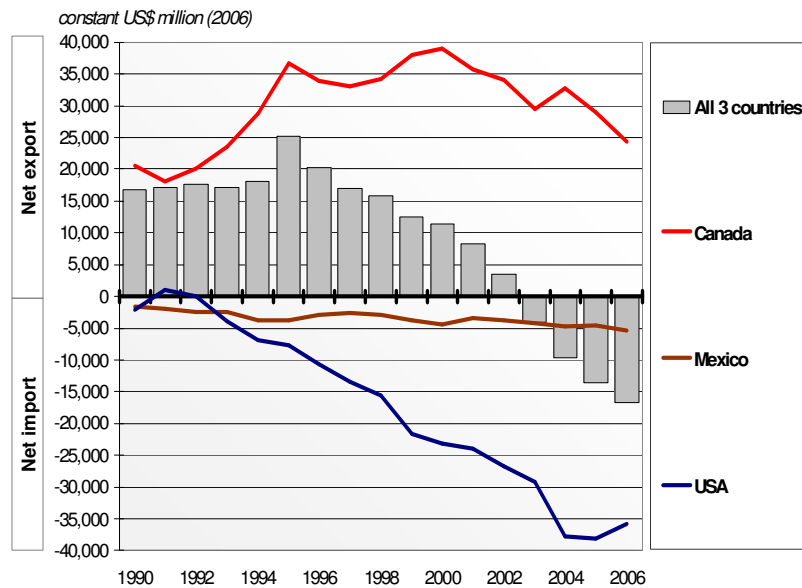
Production

The North America region (especially the USA and Canada) continues to be the world's top producer, consumer, and exporter of forest products. In 2006 the region accounted for about 38 percent of the global industrial roundwood production, increasing from about 35 percent of production in 1990 (see Figure 8). This increase is primarily accounted by Canada – whose harvest still remains below the potential supply - compensating the production decline in Mexico. The overall situation as regards production of key products is summarised below:



- Despite yearly fluctuations, industrial wood production in the United States has remained stable at about 427 million m³, although its regional and global share has declined between 1990 and 2006;
- Production of sawn wood in North America exhibits a very different trend from the global situation, as it increased from about 128 million m³ to about 154 million m³ between 1990 and 2006, while the global production has actually declined. Largely this increase reflects the demand from the construction sector in the United States, which is already showing signs of decline;
- Global production of wood-based panels doubled during the period 1990 and 2006, from about 129 million m³ to 260 million m³. Although production in North America during this period also increased from 43.8 million m³ to 65.1 million m³, the region's relative share declined indicating a significant decline in the relative share of the region. Most of the increase in the region's production is accounted by Canada;
- Global production of paper and paperboard has registered a rapid growth between 1990 and 2006, from 239 million tonnes to 365 million tonnes. Here again North America's share declined from about 39 percent in 1990 to about 28 percent in 2006, largely because of the significant investments in capacity expansion in Asia and Latin America.

In summary, it may appear that the region's production is growing at a much lower rate than global levels; this is however inevitable considering the relatively slow growth of the economies and more importantly the rapid capacity expansion in other regions.

Figure 9: Net Exports and Net Imports in North America*Trade of forest products*

One of the key features of forest products trade in the region is the growing net imports, most of which is due to the high demand from the US construction sector and the declining domestic production on account of losing competitiveness. Figure 9 provides a general indication of the

trend in net imports to and exports from the region. Canada remains a net exporter, increasing its surplus significantly during 1990 and 2006. The major change is as regards the United States, whose net imports increased from US\$ 1.6 billion in 1990 to US\$ 13.0 billion in 2006. Mexico's deficit has also shot up from US\$ 0.5 billion to over US\$ 4.0 billion, largely reflecting the opening up of the economy due to NAFTA. In the context of the slump in the US economy, imports have already declined, reducing the trade deficit.

Interestingly, this is also having a significant impact on the net exports from Canada leading to scaling down production.

Box 12: Changes in the demand and supply of forest products in the USA

“Over the past decade, foreign inflows of capital, low interest rates, doubling of home mortgage debt and rising home prices facilitated a construction boom that helped the US retain its global demand for softwood lumber and structural panels. At the same time, declining growth in US manufacturing and shift of some industrial manufacturing to other countries contributed to a shift in the global wood products production”.

Outlook for demand for wood and wood products

There is considerable short and medium term uncertainty as regards the demand for wood and wood products in the North American region, largely stemming from the current stagnation and recession of the US economy and in particular the housing sector slump. During the last few years, USA has been an attractive market for all manufactured products including wood and wood products (see Box 12). However, since 2006 there have been significant changes in trade and consumption most of the wood and wood products, reflecting the down-turn in the economy and contraction of demand. In the short and medium term trade and consumption of structural wood will depend on the speed of recovery of the US economy and the growth of the housing sector.

The Canadian forestry sector is already facing considerable difficulties in view of the declining demand from the US construction sector (see Figure 10 for a representation of Canadian dependency on US markets). Mexico also faces a similar problem (see Box 13). An

important issue is whether the wood industry in Canada will be able to diversify into new markets, especially in the emerging Asian economies and in Western Europe. In the short term such shifts will be rather difficult considering the volumes involved and in the long term it will depend on the competitiveness taking into account costs of production, processing and transport. The Canadian situation is particularly difficult in view of the large supplies expected from the salvage operations in the Mountain Pine Beetle affected forests.

Box 13: Forest products exports from Mexico

The USA continues to be the main buyer of Mexican forest product exports, in particular sawnwood (43 percent) and furniture (51 percent). This means that sector performance is strongly influenced by changes in the US demand (which depends on the long term outlook of the US economy) and the relative strength of US dollar versus the Mexican peso.

Figure 10: 2006 Canadian forest products exports distribution by country

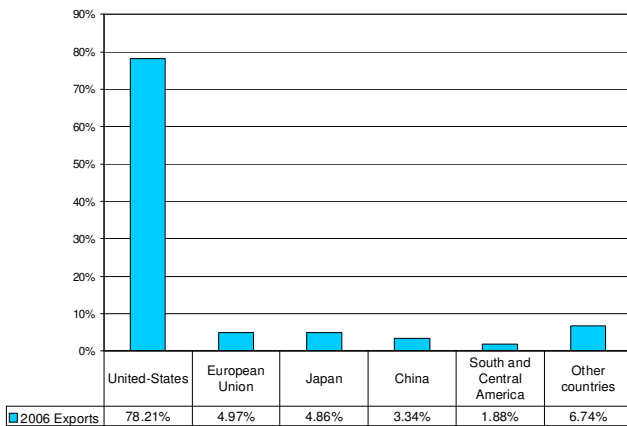
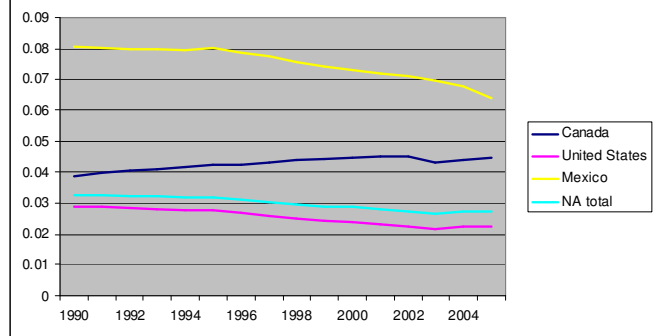


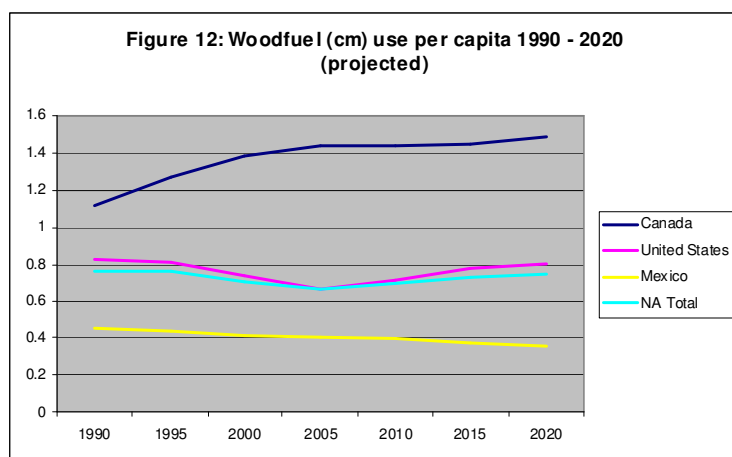
Figure 11: Woodfuel as % of total energy consumption 1990 - 2005



Wood fuel

Current trends

Use of woodfuel as a source of energy has been relatively low in the region, largely on account of the availability of alternative sources of energy. In Canada and the USA its contribution has remained below 4 percent of the total energy consumption (largely reflecting the high level of use fossil fuels), while in the case of Mexico it has declined from about 8 percent in 1990 to about 6.5 percent in 2005 (although in some *Municipio*, household dependence on woodfuel remains very high). Per capita woodfuel consumption varied from about 1.4m³ in Canada to about 0.4 m³ in Mexico (with figures also reflecting the use of black liquor, chiefly in Canada). The importance of wood as a source of household energy is declining in the context of urbanization and improved access to alternate energy sources.



In the case of Canada and the USA wood industry is in the forefront of the use of biomass energy. Production of heat and electricity using cogeneration technology using biomass feed stock is widespread in Canada and the USA. The pulp and paper industry in Canada derives 57 percent of its energy from biomass. The key question relates to whether there will be any major changes in the level of woodfuel consumption in

response to (a) escalation of costs of fossil fuels and (b) the increasing policy initiatives to promote renewable energy in response to climate change mitigation.

Wood fuel outlook

In response to the increasing costs and the various policy initiatives, there are indications of increasing importance of biomass as a source of energy (see Box 14). Substantial private and public sector investments have gone into development of cellulosic fuel technologies. While a number of pilot plants have been established, commercial scale production is yet to come. If current interest persists, certainly the demand for wood as a source of energy will increase substantially. Figure 12 provides an indication of the trend in per capita woodfuel use for energy production in North America. This however is likely to change significantly depending on a host of factors, most notably fossil fuel prices, development of commercially viable cellulosic and other technologies and more importantly policies that encourage the use of renewable energy, including various incentives.

Box 14: Some examples of policy initiatives for promoting biomass energy

Canada

- The Clean Air Agenda (2006) of the Federal Government is expected to combat green house gas emissions by setting emission targets and blended transportation fuel mandates. Substantial resources have been allocated to the ecoENERGY Renewable Power program.
- Under the Regulatory Framework for Air Emissions, renewable power production through co-generation will be encouraged through allocation of carbon credits.
- Support for transformative technologies, including biomass energy production technologies.
- Active support by provinces for renewable energy programmes with targets to generate all energy from renewable sources.

USA

- The Energy Independence and Security Act of 2007 set Renewable Fuels Standards (RFS) for blenders and refiners. A target of 22 billions of biofuels was set for 2022 and this includes wood-derived biofuels also.
- The Biofuels Initiative of 2006 includes goals to make cellulosic ethanol cost competitive by 2012 and to replace 30 percent of current levels of gasoline consumption with biofuels by 2030.
- Renewable fuel portfolio standards (RPS) set by the US states provides some support for production of energy from wood.

Non-wood forest products use and outlook

Current situation

Differences in the overall economic situation have influenced the production and use of non-wood forest products in the region. Rural communities in Mexico do depend on non-wood forest products as a means of subsistence and as a source of income, although this is declining rapidly on account of urbanization and changes in employment. In contrast, subsistence collection is negligible in the case of Canada and the USA. Some collection of non-wood forest products does take place as part of forest recreation and to cater to cultural needs. A major limitation is the absence of reliable data on the extent of subsistence, recreational and cultural collection of non-wood forest products.

Production of the few economically important NWFPs with long established markets are highly commercialised. Most notable of these are maple syrup and Christmas trees. Canada accounts for 85 percent of world's maple syrup production with the rest accounted for by the USA. Canada produced about 3.2 million Christmas trees in 2005 and this level of production has remained stable since 1994.

One segment of non-wood forest products witnessing substantial growth is herbal products, in particular medicinal plants. Markets for medicinal plants, primarily used in traditional medicines, are now expanding. Large multinational drug companies are increasingly participating in the production and marketing of herbal plant products. National retail consumption of medicinal plant-based products increased from USD 1.8 billion to USD 4.0 billion from 1996 to 1998.

The outlook for non-wood forest products

In the absence of reliable data it is difficult to provide a clear indication of the future of non-wood forest products in the region. Some general conclusions based on key trends include:

- A decline in the subsistence use of some traditional products as cheaper alternatives become available;
- Some expansion of collection of non-wood forest products for recreational and cultural activities;
- Continued stable demand for well-established non-wood forest products like maple syrup and Christmas trees;
- Significant expansion in the demand for herbal products, especially as a more health conscious society opts for the use of natural products.

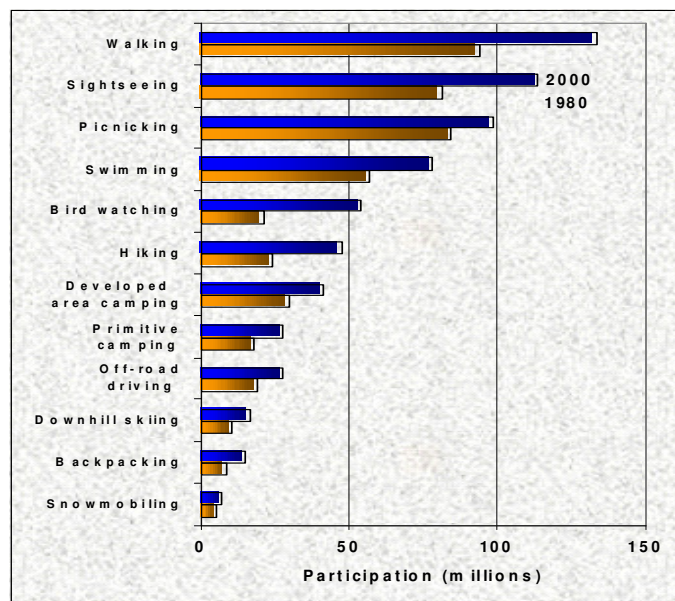
Forest derived environmental services

Participation

Current situation

Provision of environmental services has become a key objective of forestry in the region, especially in the case of United States and Canada, and out-door recreation has emerged as a major use of forests and woodlands. Especially in Canada and USA there has been a significant increase in the number of recreation visits to forests (see Figure 13) and in many places this has become the most important source of income to forest owners.

Figure 13: USA Recreational



Water is often considered as one of the most important products of the forests and forest management in the region, particularly important in a highly water deficit country like Mexico. Since most of the forests in Mexico are under communal ownership and for many communities they are important as a source of livelihood, recently Mexico has attempted a system for payment for water services (see Box 15). It is too early to assess the overall effectiveness of this. Similar initiatives exist in USA and Canada. Both in Canada and USA a series of legislations have led to an increasing emphasis on protecting wilderness and to exclude large tracts of public land from any logging or land use changes and this trend is likely to persist as driven by public interest. Addressing the various environmental concerns has led a drastic reduction of timber sales in the United States, especially from the public forests (Mac Cleery, 2008).

Box 15: Payment for hydrological services in Mexico

Mexico, as other developing economies, faces both high deforestation rates and severe water scarcity problems. In 2003, as a result of increasing awareness of the water crisis, the Mexican Government launched a Payment for Hydrological Environmental Services Program. This programme was designed by the Federal Government to compensate forest owners for the benefits derived from watershed protection and aquifer recharge coming from those areas where commercial forestry was not competitive at that time. Funds are collected on a yearly basis from federal water users. Between 2003 and 2006, USD \$110 million were allocated to land owners, both private and communal, covering approximately 500,000 ha which are currently under agreement. Initially efforts were mainly focused to creating the appropriate incentives for the provision of the environmental services; however nowadays a demand side approach is being addressed so as to create a fully functioning market.

The outlook for forest-derived environmental services

All the indications are that in the North America region, provision of environmental services will continue to gain primacy as one of the most important functions use of forests. While the economic viability of the forest industry may fluctuate and even decline, the demand for environmental services will continue to increase over time, especially in the USA and Canada. This will be the case in the case of Mexico also, although it may face some initial constraints.

SUMMARY AND OVERVIEW OF THE OUTLOOK

While there is some uncertainty as regards the forest situation as a consequence of the current recession in the United States and its impacts on all sectors that are particularly linked to the demand from the United States, there are no major surprises in the long term. Some of key features of the long term and short term outlook could be summarised as follows:

- In all countries in the region, the trend of giving emphasis to environmental values will persist and notwithstanding the current uncertainties (including short term problems of forest clearance) society will continue to assign a high priority to protection of biodiversity, protection of watersheds and mitigation of climate change. This is particularly so as society becomes more aware of the role of environmental services in their livelihood and express their willingness through market and non-market measures.
- The demand for forest recreation will continue to increase, but the changing age structure of population will have a significant impact on the type of recreational experience demanded.
- As industry adjusts to competition through scaling down production capacity and adopts more efficient technologies, the demand for timber is expected to decline. This again will reduce the area used for wood production. Some of the privately owned forests may change hands – especially as they are bought and sold by TIMOS, RIETS and other investors – and this may alter the use of land, including clearance for urban expansion.
- Provision of wood energy is expected to make a strong come back – in a very different form, especially as cellulosic biofuel production technologies become commercially viable. Many existing industries will be re-invented as “biofuel refineries” providing a wide array of products, including energy

There are several key unknowns in the future of the forestry sector in the region, including:

- To what extent will the growth of emerging forest players such as China, Chile, and Brazil and their impact on the region’s competitiveness?
- What will be the effect of climate change and the policy responses to it?
- What will be the impact of cellulosic biofuel production on the region’s forests? As a historical leader in global forest production and technological change, the region is likely to be at the forefront of major technological changes related to the use of wood for energy.

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