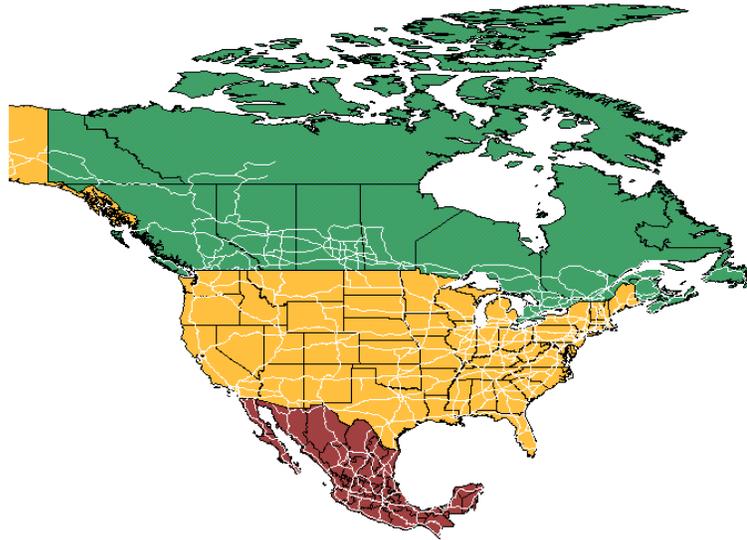


**The Forestry Industry in the State of Chihuahua:
Economic, Ecological and Social Impacts Post-NAFTA**



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May 2001



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Credits and Acknowledgements

An initial version of this report was presented at the Symposium on Understanding the Linkages between Trade and Environment sponsored by the North American Commission on Environmental Cooperation (CEC) in Washington, D.C. on October 11th, 2000. The authors would like to thank the CEC for providing a grant to assist in the preparation of this report.

The Texas Center for Policy Studies is grateful for the support of the C.S. Mott Foundation, which made research, preparation and publication of the report possible. The opinions expressed, however, are strictly those of the authors. A Spanish version of this report is also available. Contact the Texas Center for Policy Studies at tcps@texascenter.org, or check our website at www.texascenter.org, under Publications.

Executive Summary

This report examines how NAFTA has influenced the forestry and forest product industries in the northern Mexico state of Chihuahua. It also explores how these changes are affecting the forests, environment and indigenous peoples of the Sierra Tarahumara. The Sierra is an area rich in biodiversity and cultural traditions, but also one plagued by socio-political conflict, much of which centers around the forestry industry.

Wood production, particularly of pine, has increased substantially in Chihuahua since Mexico's entry into NAFTA, paralleling both an increase in both exports of wood and wood products from Mexico and an increase in imports, particularly from the U.S. During this same period, there has been significant consolidation of the forestry and forest product industries in Chihuahua and a large increase in the number of private sawmills. Forest ejidos, however, have generally remained impoverished suppliers of raw wood, with pressure on the forests intensifying greatly over the last few years. The traditional socio-political structure that controls wood product from forestry ejidos—a structure under which a few powerful leaders profit but the majority of ejido residents receive very little compensation for the wood they own in common—has persisted and adapted to changing times.

Pre-NAFTA tariffs on wood and wood products will be progressively reduced to zero by 2003 under NAFTA, though most U.S. and Canadian tariffs were already at or near zero and most Mexican tariffs were fairly low (0 to 15% in most cases). The major forest products industries operating in Chihuahua state that reduction of Mexico's tariffs will not affect their competitive positions or production levels significantly. The trade data, however, show that imports of pulp and paper products from the U.S. into Mexico have increased rapidly since NAFTA took effect. Chihuahua producers are thus under pressure to keep product prices low in order to maintain their share of the Mexican market. This dynamic could put pressure on the forest products industry in Chihuahua to oppose environmental regulations that increase its cost of doing business by either making the raw wood more expensive or by imposing additional environmental controls on pulp and paper operations.

NAFTA's provisions regarding non-tariff trade barriers could adversely affect the ability of Mexico to create and/or foster development of markets for sustainably-produced wood and wood products. This is particularly true of the NAFTA rules for adopting product standards and for government purchasing programs. Much depends on how these provisions are ultimately interpreted and applied. Of more immediate concern, however, are recent interpretations of NAFTA's Chapter 11 investment provisions, particularly the Metalclad case. If this type of case is allowed to stand, it would pose a substantial threat to Mexico's ability to adequately regulate forestry or forest product operations of companies from the U.S. or Canada.

In the last few years, indigenous leaders and others have filed hundreds of citizen complaints about illegal cutting and other unsustainable forestry practices in the Sierra Tarahumara. Government response to these complaints, and enforcement of forestry and environmental laws in the Sierra, has, on the whole, been inadequate. Indigenous leaders, peasants, non-governmental organizations and others are now asking for public audits of forestry operations. They are also seeking comprehensive environmental studies to assess the damage being done by these forestry operations and provide the basis for a land management system that protects the forests and the environment. Forestry ejidos in the Sierra will require substantial technical and financial resources, including market development assistance, to move toward more sustainable forestry. The current corrupt ejido control system that dominates forestry practices in many Sierra ejidos will also have to be addressed if real progress is to be made.

Chapter 1. Introduction and Methodology

I. METHODOLOGY

This report applies the CEC's Final Analytic Framework for Assessing the Environment Effects of NAFTA¹ to the forestry and forestry products sectors² in the State of Chihuahua, Mexico. While the report does not cover the furniture-making and construction industry per se, the role of these sectors as the ultimate users of wood is considered.

The report examines the applicability of three of the hypotheses contained in the CEC's final analytic framework to the Chihuahuan forestry and forest products industries. As applied to these industries, the hypotheses give rise to the following questions:

- Does economy-wide liberalization associated with NAFTA intensify competitive pressures for companies and individuals in the forest and forest product industries to reduce the component of their production costs associated with environmental compliance? As a corollary question, is government enforcement of environmental regulations adequate to prevent adverse environmental effects that might be associated with increased production triggered by NAFTA or related factors?
- Has NAFTA led to a reorganization of the forestry or forest product industries, concentrating production in Chihuahua in sectors where it takes place most efficiently, or do the changes in the industry have further negative impacts on social organization and biodiversity?
- Do or could NAFTA's liberalized rules of trade lead impede or enhance the implementation of sustainable forestry practices in Chihuahua?

In preparing the report we relied on government documents, literature sources and the considerable “on the ground” experience of COSYDDHAC in its work with indigenous Tarahumara forestry ejidos in Chihuahua.

II. REPORT ORGANIZATION

Chapter 2 examines the broader context—including environmental, legal, economic, and geographic factors—that influence the forestry and forestry products sectors in Chihuahua. Chapter 3 examines the specific potential impacts that NAFTA could have on these sectors and on the regulation of their effects on the environment. It also examines whether NAFTA rules and practice do or could impede the implementation of more sustainable forestry practices in Chihuahua. Chapter 4 examines post-NAFTA trends in trade of wood and wood products and profiles developments in the wood processing and pulp and paper sectors in Chihuahua. It also examines key factors underlying these trends.

The links between changes in production patterns and social and environmental consequences are examined in Chapter 5. These links include the degree to which the underlying socio-political structure in

¹ An earlier version of this paper was presented to the CEC's NAFTA Environmental Effects Symposium in Washington, D.C. in October 2000. A description of the Final Analytical Framework is available on the CEC's website. (For information on the Symposium and the Framework, see www.cec.org/symposium or www.iisd.ca/sd/cec/index.html).

² Including logging operations, sawmills, and manufacturing of particleboard, plywood, molding, wood crates, consumer and industrial pulp and paper products.

forest ejidos contributes to unsustainable logging practices, the response of the Sierra's indigenous peoples to perceived threats to their forests, and how the government has—or has not—acted to adequately enforce environmental and forestry laws. Chapter 6 presents the limited available information on environmental indicators that can be used to quantify the impacts of changes in these industries as they operate in Chihuahua. These indicators include deforestation, loss of biodiversity, impacts on water quality and reservoir sedimentation through erosion of forest soils. Conclusions and recommendations are presented in Chapter 7.

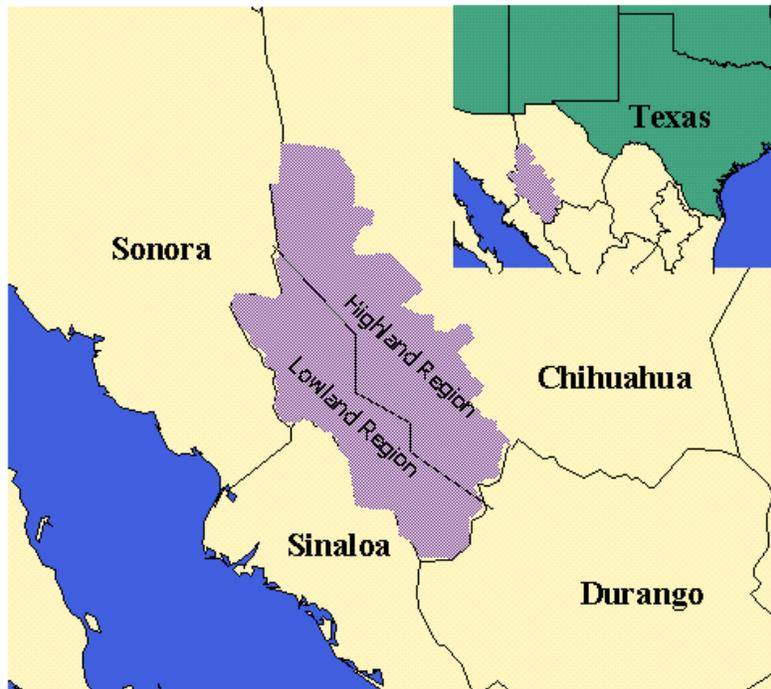
Chapter 2. Border Context: Geographic, Environmental, Economic, Social and Political Background

Many of the geographic, environmental, economic, social and political factors that influence the forestry sector in the Sierra Tarahumara have a long history and are not directly related to NAFTA itself. This chapter provides an abridged guide to some of those factors.³

I. GEOGRAPHY AND ENVIRONMENT

The state of Chihuahua accounts for 12.6% of Mexico's landmass and is located in the northernmost extreme of the country, bordering Texas and New Mexico. While most of the state is arid and typified by the Chihuahuan Desert region, the Sierra Madre Occidental, the southward continuation of the Rocky Mountains, covers about 53,400 square kilometers, or approximately 25% of the state's total landmass (Map A). The Sierra Madre Occidental in Chihuahua, sometimes called the Sierra Tarahumara, contains two well-defined topographic regions, each with its own climate, wildlife, and demographic distribution patterns. One region, the highlands, has cool, temperate pine-oak forests, including many species with commercial value, such as the ponderosa, arizonica and chihuahuana pines. The lowlands, toward the west, have a drier, hotter tropical climate and deep, rugged canyonlands. The State of Chihuahua has 7.6 million hectares of forested lands, more than any other state in Mexico.

**Map A. Geographical Regions
of the Sierra Madre of Chihuahua**



³ Much of the information presented in this Chapter is derived from a previous COSYDDHAC/TCPS report on the impacts of the forestry industry in Chihuahua (COSYDDHAC/TCPS 2000).

Not surprisingly, both the highlands and lowlands give rise to unique habitats and together are considered one of the most biodiverse regions of the North American continent.⁴ One study found that the region has 4,000 species of flora, including hundreds of medicinal and edible plants, and 438 vertebrate species -- including 268 species of birds (Ceballos 1993). Many species of birds, reptiles and amphibians are endemic to the region. Some of these species are already extinct, and several are endangered, including the Thick-billed Parrot. The region is also important hydrologically, with the forests capturing precipitation, recycling nutrients and helping form stable waterways that benefit enormous river basins. The water that originates in the Sierra feeds into five major river basins. It includes the headwaters of the Yaqui and Mayo Rivers, which flow west into Sonora; the headwaters of the Fuerte and Sinaloa Rivers, which flow west into Sinaloa; and headwaters of the Conchos River, which flows north to join the Rio Grande just upstream of Big Bend National Park. Much of the farming that occurs in Texas, Coahuila, Nuevo León and Tamaulipas—as well farming in the Conchos basin itself—depends heavily on the flow Conchos River and, consequently, upon what happens in the Sierra Madre.

II. PEOPLES AND LAND OWNERSHIP

Most of the Chihuahua's population is located in the central plains, within the Cd. Chihuahua or the border city of Juárez. The Sierra Madre region itself is sparsely populated. According to 1990 figures, 280,000 individuals live in the 19 municipalities making up the Sierra Tarahumara, about 20% of whom are indigenous peoples with their own unique culture (INEGI 1994). The largest of these groups is the Tarahumara, who call themselves Rarámuri in the highland Region and Rarámari in the lowland Region. Other indigenous groups include the Tepehuán, Guarojíos and Pima. These indigenous peoples coexist with mestizos (mixed blood), although the mestizos tend to occupy the region's main urban centers, while the indigenous people tend to live in hamlets or live in farming communities known as ejidos. The ejido is a form of social property, the result of the 1910 Mexican revolution and subsequent land reforms.⁵

About 40 percent of all land in Chihuahua is considered social property, and about 17.5% of this lies in the Sierra Madre Occidental. As in other areas of Mexico, the forests themselves are mainly owned as social property by ejidos. Forest ejidos (those ejidos with a large portions of their land being forest) were given jurisdiction of the forest resource and arable lands within their property boundaries. Forest ejidos presently account for more than 90% of the state's timber production.

In November 1992, before NAFTA was signed, President Carlos Salinas de Gortari introduced a series of fundamental reforms of the Mexican Constitution, including Article 27, dramatically altering the traditional, social ownership of land. The modifications of Article 27 allowed ejido land to be rented or sold to individuals or to foreign or domestic corporations. Ejidatarios could now sell their private forest holdings to whomever they choose or offer their land rights as collateral for loans. In addition, the 100-hectare limit on private forestry holdings was eliminated, and replaced with a limit of 20,000 hectares for development of forest management areas or forestry plantations. In making these changes, the Mexican government was both seeking a way for ejidatarios to increase productivity on their lands and to attract direct investment from domestic and foreign corporations, primarily in anticipation of NAFTA (Cornelius & Myhre, 1998).

Despite the Article 27 changes, in the Sierra Tarahumara most ejidos have continued to operate as traditional ejidos, and have not attempted to turn their social property into individual parcels. In fact,

⁴ Along with adjoining mountains in southern Arizona and New Mexico, the Sierra Madre Occidental in Chihuahua has been nominated by a group of scientists for IUCN designation as a center of "mega-diversity".

⁵ The revolution resulted in the system of land reform laid out in Article 27 of the Mexican Constitution of 1917. Article 27 broke up foreign-owned haciendas and limited individual holding to no more than 100 hectares of land for most agricultural purposes.

through April of 1999, only 33 of the 1004 ejidos of the state of Chihuahua had requested "pleno dominio."⁶ Only 4 had actually completed the process known as PROCEDE to certify and title their land, and then voluntarily dissolve the ejido. In all of the Chihuahuan *indigenous* forest ejidos, in fact, farmers have used the PROCEDE process to reaffirm the social ownership of land. Nonetheless, the changes in Article 27 mean the forests are subject to the possibility of outside direct investment through the selling or leasing of ejido lands.

III. ECONOMIC HISTORY OF THE SIERRA

Given its abundant natural resources (forests, minerals and water), the Sierra Tarahumara region has traditionally attracted attention as an economic niche for the extraction of raw materials. Mining was the first industry in the Sierra, developing during the 18th and 19th century. The forests provided needed raw materials for this activity, but forestry itself did not become a primary economic activity until the second half of the 19th century. Early in the 20th century, the Chihuahuan forests became a source of raw material for U.S. industry and for fuel for new steam engines which crisscrossed the Sierra. Large concessions were granted to U.S. lumber and railroad companies during the Porfirio Díaz era in Mexico by Chihuahuan Governor Enrique Creel. Later, these lands would be expropriated and given to national lumber companies following the 1910 Mexican Revolution. During the 1950s and 60s, the Executive Branch in Chihuahua gave concessions for harvesting trees to companies such as Bosques de Chihuahua, Ponderosa de Chihuahua, Chihuahua Industrial, Comercial e Industrial Pacífico and González Ugarte.

In 1952, a large paper mill (Celulosa de Chihuahua, owned by the "Grupo Chihuahua") was opened in Anáhuac. That same year a concession over 613,000 acres of forested land was given to the company Bosques de Chihuahua to supply the Anáhuac plant, as well as other industries. In the 1970s, this policy of granting concessions to national companies was changed as land was redistributed to ejidos. For example, in 1971, President Luis Echeverría rescinded the Bosques de Chihuahua concession in the municipality of Madera, turning it over instead to 1,455 farmers. Slowly, land was turned over to ejidos. Some of the forestry business was turned over to state-controlled enterprises which provided technical forestry services to the ejidos, led by the company Productores Forestales de la Tarahumara (PROFORTARAH). Private companies were forced to negotiate with ejidos, private landowners or these state-owned companies to find timber supplies. Both the large concessions and the state-controlled production led to over-logging and poor management of the forests.

In 1989, PROFORTARAH ceased operation, turning its profits over to nine Unions of Ejidos, which were supposed to process the wood and mill it into beams and boards. In the last ten years, many of these "social" production businesses have failed, and ejidos have largely been supplying raw wood to privately-owned sawmills, forestry companies and pulp manufacturers. As Chapter 4 details, there has been significant reorganization of the Chihuahuan forestry industry in the last few years, with large multinational companies consolidating their position in the Chihuahuan forest and forestry sectors. Today, Chihuahua is second only to its neighbor Durango in total wood production, and Chihuahua as a state earned more money from forestry products than any other state in Mexico during 1997. (SEMARNAP A 1998, 19).

While the forests of Chihuahua have generated profits for the owners of lumber companies and paper and pulp sector, ejidos and indigenous communities have received little benefit from their forest resources. Thus, while ejidos control the forest's timber, today and historically, it has only been a source of subsistence income, with the ejidatario entitled to an annual dividend from the sale of the wood (see Chapter 5 for further discussion).

⁶ This is the process by which the social property of the ejido can be converted to individually-held parcels.

The forests are important to their inhabitants in ways other than as a source of commercial timber. They provide the construction materials for their dwellings and are the source of many edible plants and medicinal herbs, several of which are endemic to the region. In addition to forestry activities, indigenous farmers cultivate corn, beans and vegetables, and herd goats and cattle. Some residents emigrate to work in the fields of nearby states of Sinaloa and Sonora, or work in larger cities in maquilas or the construction industry. Still others have sought better living conditions in the U.S. Finally, in the last 20 years, the cultivation of marijuana and opium poppy has spread to some areas of the Sierra. Some farmers have supplemented their income by cultivating these crops, despite the risk of being punished by authorities.

IV. GOVERNMENTAL REGULATION AND SUPPORT OF FORESTRY

A. Forestry Regulation

Mexico has been regulating forestry since 1884, through a series of federal laws. While a complete history of these efforts is beyond the scope of this report, certain more recent developments in forestry legislation—both before and after NAFTA—are particularly relevant. Mexico's 1986 Forestry Law was an effort to strengthen regulation of the forestry industry and its potential adverse impacts on the environment. The law assigned institutional responsibilities for forestry to two main government agencies: the Ministry of Agriculture and Water Resources (SARH) and the Ministry of Social Development (SEDESOL). Within SARH, the Forest and Wildlife Subsecretariat (SFF) was responsible for the regulation of silviculture, soil conservation, and reforestation; the inventory of Mexico's forest resources; promotion of research; and management of certain forested public lands (ELI 1998, 43). SARH staff worked closely with foresters and engineers of commercial and quasi-governmental entities to inventory timberlands and regulate timber harvests. Meanwhile, SEDESOL was the central environmental ministry. Within SEDESOL, the Institute of Ecology (INE) had general responsibility for setting standards for environmental and natural resource protection. The INE also required companies to submit forest management plans for all forestry projects.

The 1986 Forestry Law introduced more systematic environmental regulation for the forestry sector, including requirements for forest management plans and permits for transport, processing and sales of wood. However, in response to criticisms that the law was overly burdensome for the forestry industry, a new law was enacted in 1992, while NAFTA was being negotiated. The 1992 reforms represented a concerted effort to reduce regulation of forestry operations. It deregulated controls on logging and left "forest management plans" as the main regulatory mechanism for most forest projects.

The 1992 law did require applicants seeking permission to harvest timber to either hold title to the land or hold a legal right to harvest its timber. Among other requirements, the forest management plans had to be written by qualified foresters, delineate the location of plots, describe the physical and biological characteristics of the forest ecosystem, identify the techniques that would be used for extraction, forestation, or reforestation, and specify the measures that would be used to conserve and protect natural habitat (World Bank 1995, 71). The 1992 law, however, deregulated the transportation of forest goods, an activity previously controlled by documentation (*guías forestales*) that served as both a permit and a way to calculate the volume of wood being extracted. Under the 1992 law, the only requirement was the appearance of a hammer mark on the logs: each ejido had its own stamp and the mark was supposed to prove that the wood had been legitimately cut. This approach, however, made the statistical documentation of annual wood production virtually impossible and is believed to have increased illegal logging (PROFEPA 1998).

The changes that began in 1992 with the reformed Forestry Law, continued in 1994 with reform of the General Ecology Law and Mexico's (just after Mexico's entry into NAFTA) and culminated in 1997 with further reforms of the Forestry Law. The Mexican government reformed the General Law of Ecological

Equilibrium and Environmental Protection [*Ley General de Equilibrio Ecologico y Proteccion Ambiental* (LGEEPA)] in December 1994. These reforms combined the forest management functions of SARH with the general environmental responsibilities of SEDESOL into a new, centralized Ministry of Environment, Natural Resources and Fisheries (SEMARNAP). In the process, SEMARNAP was charged with: (a) defining the principles for ecological policy and ecological management; (b) preservation, restoration, and improvement of the environment; (c) protection of natural areas, wild and aquatic flora and fauna; and (d) prevention and control of air, water and land pollution. These duties also included managing and protecting Mexico's forestry resources.

The 1994 reforms also created the Attorney General's Office for the Protection of the Environment (PROFEPA) to enforce environmental regulations, investigate violations, administer justice and respond to "popular complaints." Tarahumara and Tepehuanes of the Sierra have made use of popular complaint provisions in the federal environmental law to defend their forests (See Chapter 5).

On April 16, 1997 President Ernesto Zedillo's administration presented the Mexican Congress with new reforms to the Forestry Law. The 1997 reforms focused on solving the problems of illegal cutting [*tala ilegal*], unregulated commercial forest plantations and technical forestry services. The new law reestablished some regulations that had been eliminated in 1992 by requiring documentation and control of activities such as harvesting, transport, storage and processing. It is important to note, however, that many of the rules to implement the changes contained within the 1997 Forestry Law have only recently been implemented.

Table 2.1 summarizes relevant legislative changes.

Table 2.1. Legislative Changes Affecting the Forestry Sector

Legislation	Principle Relevant Changes
Article 27 of the Mexican Constitution and Agricultral Law (1992)	<ul style="list-style-type: none"> * End agricultural land distribution programs * Introduce means to promote private, corporate investment in the countryside * Allow for the possibility of privatizing social property (ejido and communal property)
Article 27 of the Mexican Constitution and Forestry Law (1992)	<ul style="list-style-type: none"> * Introduce the concept of sustainable development * Eliminate regulations for the transport and sale of forestry products * Privatize technical forestry services
New Federal Environmental Law (1994)	<ul style="list-style-type: none"> * Incorporate forestry management responsibilities into new over-arching environmental agency, SEMARNAP * Create PROFEPA to investigate and resolve environmental complaints and enforce environmental regulations
Art. 4 of the Mexican Constitution and Revisions to the Federal Environmental Law	<ul style="list-style-type: none"> * Provide that each person has a right to an environment adequate for his or her development, linked to Art. 4 of the Mexican Constitution * Established more precise procedures for handling popular complaints.
Forestry Law Revisions (1997)	<ul style="list-style-type: none"> * Reinstate controls over transport and sale of wood * Include commercial forestry plantations as an authorized forestry development approach

Taken together, the changes to Art. 27 of the Mexican constitution and to the federal forestry and environmental laws provide increased commercial access to land and natural resources in Mexico, under the rubric of “sustainable development”. In practice, however, the concept of sustainable development can sometimes include only the application of economic and technological principles, with minimal consideration being given to environmental and social concerns.

In addition to these domestic programs to regulate and encourage forestry production, Mexico is signatory to several international binding treaties covering forest management. For example, in 1992, Mexico signed and ratified the United Nations Conference on Environment and Development (UNCED) adopted the Convention on Biological Diversity. Since then, Mexico has taken steps to fulfill obligations under the Convention, including the creation of the National Commission for Knowledge and Use of Biodiversity (CONABIO), which has established both a computer network for biodiversity information (REMIB) as well as a national system of biodiversity information (SNIB). Other treaties signed and ratified by Mexico with potential implications for forest management include the UN Convention on Climate Change (1992), the Convention on International Trade in Endangered Species (CITES --ratified in Mexico in 1991), which restricts trade of flora and fauna, the La Paz Agreement (Agreement between the United States of America and United Mexican States on Cooperation for the Protection and Improvement of the Environment in the Border Area (1983), and the Migratory Bird Treaty between the U.S. and Mexico (1937, amended in 1972). In addition, the U.S. and Mexico have signed a Memorandum of Understanding on Cooperation in Management of National Parks and Other Protected Natural and Cultural Heritage Sites. The U.S Forest Service and the U.S. Fish and Wildlife Service have worked cooperatively with Mexican officials under these and other international agreements.

Along with nine other countries, Mexico has also formed a Working Group on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests ("the Montreal Process"). This group has come up with a list of criteria and indicators for the sustainable management of forests. In addition, one well-known NGO—the Forest Stewardship Council—has produced its own criteria for sustainable forest management and established headquarters in Abaca. Finally, Mexico is participating in Canada's Model Forest Program, setting up pilot projects in Chihuahua and Capuche with Canadian funds.

B. Support for the Forestry Industry

The 1997 Forestry Law reforms also established the Program for Forest Development (PRODEFOR) and the Program for Plantation Development (PRODEPLAN). These programs provide various government subsidies for the production of wood from natural forests and commercial plantations.

PRODEFOR operates through subsidies and grants provided by SEMARNAP, primarily to ejidos in order to improve the ejidos' technical handling of forest resources. PRODEFOR is essentially a subsidy program for forestry development designed to benefit producers by increasing economic integration and competitiveness. The program has the objective of promoting the development of the social forestry sector by forming more efficient production units. According to SEMARNAP, in 1997 PRODEFOR provided nearly 23 million pesos in direct subsidies to ejidos, communities, and small forest properties nationwide, which permitted the incorporation of 316,000 hectares of forested lands into timber production. Over 3,000 landowners have also received training through the program (SEMARNAP B1998). In Chihuahua, forest ejidos do not directly receive PRODEFOR funding. These resources are channeled instead through the forestry consultancy associations, the organizations responsible for managing and applying the programs.

PRODEPLAN, on the other hand, was designed to finance commercial plantations through a combination of direct subsidies and tax incentives that could cover up to 65% of the cost of establishing and maintaining the plantations over a seven-year span. Through subsidies, the Mexican government encourages the private sector to convert both degraded and agricultural lands into commercial timber plantations as a viable method of silviculture. The objective is to establish 875,000 hectares of commercial forest plantations in a period of 25 years. Though the reforms prohibited commercial plantations in areas where they would substitute for the natural vegetation of forested lands, the plantation program focuses on creating large commercial plantations of rapid-growth species that require optimal soil and humidity conditions.

In this favorable business climate, large consortia have formed to establish commercial plantations in Mexico. According to SEMARNAP figures, only 15,000 hectares were designated for commercial plantations in 1970. In 1997, however, SEMARNAP approved 13 new plantation projects covering 48,000 hectares through the PRODEPLAN program. (See Table 2.2) SEMARNAP projected that in 1998 it would channel about 250 million pesos into direct subsidies to help set up an additional 68,000 hectares of commercial plantations and to reforest 10,000 hectares with native vegetation (SEMARNAP B 1998).

Table 2.2. Types and sizes of projects approved under PRODEPLAN, 1997

Type of Wood	Less than 100 Hectares	100- 1,000 Hectares	Greater Than 1,000 Hectares	Total Number of Projects	Total Hectares
Pine/ Christmas Trees	8	9	1	18	9,155
Eucalyptus	0	1	3	4	11,609
Red Cedar, Mahogany, and tropical species	10	6	2	18	7,101
Total	18	16	6	40	27,865

Source: SEMARNAP, *Anuario Estadístico de Producción Forestal, 1997*, p. 101.

Several companies have started operating large-scale commercial plantations in southeastern Mexico through subsidies provided by PRODEPLAN. The companies include PLANFOSUR-Simpson (in Tabasco and Veracruz), PULSAR International of Monterrey (now called SAVIA), Nuevo León (in Tabasco, Campeche, Chiapas), and International Paper Company (in Tabasco, Chiapas, Veracruz and Campeche). Commercial plantations set up in the warm, tropical climates of northern Nayarit and southern Sinaloa have been established through agreements between private farmers and companies, including Kimberley-Clark de Mexico. In Chihuahua, however, despite some proposals, only a few small plantations in the northeast of the state near Ojinaga have been established, and the PRODEPLAN program has not yet had much effect. New eucalyptus projects are being established or proposed for several ejidos in the municipality of Ojinaga.

Chapter 3. NAFTA Connections and Institutions

I. INTRODUCTION

North American trade in wood and wood products is affected by many factors, including, but not limited to:

- currency values;
- macro-economic conditions (e.g. a healthy economy driving a construction boom);
- production costs (e.g. labor costs, environmental standards and/or production subsidies); and
- tariff and non-tariff barriers to trade.

As other research indicates, and as we discuss in this report, factors such as currency values, macro-economic conditions and production costs significantly affect on North American trade in wood and wood products.⁷

This section of the report, however, focuses primarily on NAFTA's effect on existing and potential tariff and non-tariff measures related to trade in wood and wood products. We also examine the provisions of the NAFTA Environmental Side Agreement as they relate to overall economic and environmental policy decisions potentially affecting forestry in Mexico, particularly in the state of Chihuahua.

We include a discussion of how the scope and work plans of various NAFTA institutions relate to forestry production in Mexico and North American trade in wood and wood products. We conclude with a brief discussion of how trade/export promotion, much of which is at least indirectly associated with NAFTA, does (or does not) incorporate notions of sustainable forest management and conservation.

II. CHANGES IN TARIFFS AND QUANTITATIVE RESTRICTIONS

Under Article 302 of NAFTA, tariffs on goods are progressively eliminated over a 10 to 15-year period. Most U.S. tariffs on imported wood and wood products are already near zero. Canadian tariffs have also been reduced to near zero on most products as a result of the U.S./Canada free trade agreement, with reductions beginning in 1989 (Kosco 1998). Thus, NAFTA tariff reductions are most significant for wood and wood products imported into Mexico. **Table 3-1** shows the basic reductions in Mexican tariffs on a variety of wood and wood products.

⁷ This is especially true for U.S.-Canada trade (Kosco 1999). Macro-economic conditions and currency valuation, however, have also played a very strong role with respect to U.S./Mexico trade in wood and wood products (Juarez, et al. 1999; Lyke 1998).

Table 3.1. Mexican Wood and Wood Product Tariff Elimination Under NAFTA

Commodity	Pre-NAFTA Tariff	Post-NAFTA Tariff
Softwood lumber, rough or dressed	10 to 15 %	0*
Particleboard	20%	Phase out over 10 yrs.
Softwood plywood	15%	Phase out over 10 yrs.
Wood pulp		
--Mechanical	5%	Phase out over 10 yrs.
--Other	0 to 5%	0
Newsprint	15%	Phase out over 5-6 yrs.
Other paper and board	10%	Phase out over 0-10 yrs.

Source: Lyke 1998.

*Immediate phase-out applied to lumber used in the manufacture of timber frame housing. For all other lumber, tariffs are phased out equally over 5 years.

According to one analyst, one of the most important tariff reductions was the immediate elimination of the duty on lumber used in timber-frame housing (Lyke 1998). Wood producers in the U.S. want to export more wood to Mexico for timber-frame housing. Currently, for a variety of reasons (including weather conditions, durability, pest resistance, stability, price, and use of local materials) most housing in Mexico is constructed of concrete, masonry or adobe. However, U.S. exporters want to promote timber-frame housing and were counting on a general post-NAFTA boom in the Mexican economy to drive the housing market and demand for timber. The continued push by U.S. interests to promote use of timber-frame housing in Mexico—in place of existing construction methods that rely more sustainable local construction materials—is discussed further in Section VI, below.

In addition to progressive elimination of tariffs, Mexico agreed under NAFTA to convert its quantitative restrictions on imports of certain wood and wood products to “tariff rate quotas” or TRQs. These TRQs provide that a certain quantity of product can enter the country duty-free, while anything over that amount is subject to a tariff. This tariff, however, is also reduced to zero over a 10-year period. In addition, the amount of product that can be imported duty-free can increase. Table 3.2 shows the *initial* Mexican TRQs for various wood and wood products.

Table 3.2. Mexico’s TRQs for Various Lumber Products

Product	TRQ (metric tons)	Over-quota tariff
Oak lumber over 6 mm thick	3,325	15
Logs	14,250	10
Pine and fir lumber	119,700	10
Other lumber	2,470	15
Coniferous lumber	9,500	15
Coniferous wood chips, particles	66,500	10
Coniferous lumber, small boards	950	10
Stained logs	750	10

Mexico is implementing the TRQ system through “auctions”. That is, the Mexican government “auctions” off the right to import the product duty-free, up to the quota limit. In one of the recent

auctions, however, most of the duty-free quota was unallocated, except for oak planks (Juarez, et al 1999, 5). According to the U.S. Department of Agriculture's Foreign Agricultural Service, "importers do not rely on the TRQs, particularly for softwood plank...Reportedly, they continue to prefer paying the import duty (now 4 percent) instead of participating in the auction process." (Juarez, et al 1999, 5). Previous reports indicate that industry was complaining that the Mexican TRQ system was "neither efficient nor effective." (Lyke 1998, 27).

Virtually all North American tariffs on wood and wood products (i.e. tariffs imposed by one of the NAFTA countries on products from another of the NAFTA countries) will be eliminated under NAFTA by 2003. Given that, and given the delay in the WTO's proposed "Accelerated Tariff Liberalization" package for forestry products,⁸ the ATL should not have much effect on forestry trade *among* the U.S., Canada and Mexico.

III. NON-TARIFF BARRIERS

There are various types of restrictions, regulations and standards that are oftentimes characterized as "non-tariff" barriers to trade. With respect to wood and wood products, these generally fall into seven categories (Sizer, et al 1999):

- Quantitative restrictions on imports (see discussion in Section II, above);
- Phytosanitary standards to prevent importation of exotic pests and diseases;
- Technical regulations designed to protect human health and safety (e.g. wood strength or use of chemicals on wood);
- Labeling requirements (including quality-labeling and voluntary eco-labeling);
- Requirements for recycling and waste recovery;
- Subsidies, tax breaks and export promotion for domestic producers; and
- Export restrictions (e.g. export restrictions on raw logs).

Article 309 of NAFTA essentially provides that import/export restrictions are governed by the rules of the General Agreement on Tariffs and Trade (GATT). Annex 301.3 specifically provides that Article 309 rules *do not apply* to the "export of logs of all species."

Chapter 7 of NAFTA governs the adoption and implementation of phytosanitary standards. Chapter 9 governs the use of technical product standards in NAFTA countries. Provisions that relate to treatment of investors are contained in NAFTA's Chapter 11. Restrictions on government procurement procedures are set out in Chapter 10. The application of countervailing duty measures to counter subsidies provided by one country to its domestic producers is governed by Chapter 19, and by a specific WTO agreement on subsidies.

These NAFTA provisions and their relationship to the types of non-tariff barriers to forestry trade that have been discussed in the literature are examined below. It should be noted, however, that NAFTA refers to and/or incorporates various provisions of GATT/WTO agreements and, in some instances, the controlling legal authority is not clear (Abbot 1999). Thus, to some extent, an examination of GATT/WTO agreements and decisions is important to interpreting the potential effect of NAFTA on various standards or policies that might be challenged as non-tariff barriers to forestry trade among the U.S., Canada and Mexico.

⁸ The November 1999 meetings of the WTO in Seattle did not result in an agreement to proceed with development and implementation of the ATL. As proposed, the ATL would have eliminated WTO country tariffs on a wide range of wood and wood products by 2002). A USTR study predicted that harvesting of secondary forests in Mexico would *decrease* by about 2 % under the proposed ATL (U.S. Trade Representative, 1999).

A. Phytosanitary Standards.

Chapter 7 of NAFTA applies to sanitary and phytosanitary standards (SPS) that may “directly or indirectly” affect trade between the NAFTA Parties. Article 710 essentially exempts SPS development, adoption and enforcement from the GATT/WTO regime incorporated into Articles 301 and 309 of NAFTA. Instead, NAFTA has its own set of standards for “trade-legal” SPS. Article 712 sets out the basic rights and obligations of the NAFTA partners with respect to SPS. The relevant provisions are set out in Box 3-1.

Box 3-1. Provisions of Article 712 of NAFTA

1. Each Party may, in accordance with this Subchapter, adopt, maintain or apply any sanitary or phytosanitary measure necessary for the protection of human, animal or plant life or health in its territory, including a measure more stringent than an international standard, guideline or recommendation.

Right to Establish Level of Protection

2. Notwithstanding any other provision of this Subchapter, each Party may, in protecting human, animal or plant life or health, establish its appropriate level of protection in accordance with Article 757.

Scientific Principles

3. Each Party shall ensure that any sanitary or phytosanitary measure that it adopts, maintains or applies is:

(a) based on scientific principles, taking into account relevant factors including, where appropriate, different geographic conditions;

(b) not maintained where there is no longer a scientific basis for it; and

(c) based on a risk assessment, as appropriate to the circumstances.

Non-Discriminatory Treatment

4. Each Party shall ensure that a sanitary or phytosanitary measure that it adopts, maintains or applies does not arbitrarily or unjustifiably discriminate between its goods and like goods of another Party, or between goods of another Party and like goods of any other country, where identical or similar conditions prevail.

Unnecessary Obstacles

5. Each Party shall ensure that any sanitary or phytosanitary measure that it adopts, maintains or applies is applied only to the extent necessary to achieve its appropriate level of protection, taking into account technical and economic feasibility.

Disguised Restrictions

6. No Party may adopt, maintain or apply any sanitary or phytosanitary measure with a view to, or with the effect of, creating a disguised restriction to trade between the Parties.

The core requirements are that SPS have a “scientific” basis, be based on “risk assessments”, not discriminate against imported products and not pose “unnecessary obstacles” or constitute a “disguised restriction on trade.” Chapter 7 also has a multitude of provisions for the development of SPS, including preferential reliance on “international standards” (Article 713), requirements for risk assessments (Article 715), adoption of standards to regional conditions (Article 716) and various mandatory adoption and implementation procedures (Articles 717-721).

It appears that, to date, there have not been many wood or wood-product related SPS disputes between U.S. and Mexico or Canada and Mexico. One pending issue, however, offers insight into how the governments view SPS issues. In 1998, Mexico’s natural resource agency, SEMARNAP, proposed two new regulations relating to the importation of new and used lumber (FAS #s MX8061 and MX8062 1998). These rules would have required certification that the lumber came from a zone “free of pests and disease.” The rules would also have required inspection of the lumber at the border. If the inspection found any of three special pests of concern, the load would be destroyed or returned.⁹ If the inspection found *any* pests, the lumber would have to be fumigated at the border for 48 hours, with either methyl bromide or aluminum phosphorus.

In commenting on the proposed regulations, the Foreign Agricultural Service of the U.S. Department of Agriculture stated that it would be “a serious problem” for USDA to make the required “certification.” It also noted that that wood exporters were concerned about what would happen to their shipments under the new regulation, which could, in turn, cause a disruption in lumber trade and “hardship” for the U.S. lumber industry (FAS #s MX8061 and MX8062 1998). Nowhere does the public record indicate that the FAS also commented that a top U.S. environmental priority has been the elimination of the use of methyl bromide (a dangerous fumigant and a substance implicated in the thinning of the ozone layer)¹⁰, nor does the public record indicate that the FAS expressed concerns about potential effects on customs workers or communities living near border entry ports that might be exposed to the fumigant. Available information indicates that Mexico has yet to adopt the two proposed regulations. SEMARNAP has apparently agreed

⁹ The special pests of concern are gypsy moth, the formosan subterranean termite and the powderpost beetle.

¹⁰ The Montreal Protocol on Substances that Deplete the Ozone Layer calls for phase-out of methyl bromide in developed countries by 2005. See 40 C.F.R. part 182 for U.S. EPA rules on domestic phase-out of methyl bromide.

the final rules will be based on “sound science and will not impede U.S. wood exports to Mexico.” (Juarez et al 1999, 4).

This proposed SPS highlights two important points. First, it shows clearly how the SPS chapter of NAFTA allows non-domestic entities (whether private or government) to have significant influence on the adoption of domestic standards—in this case a standard designed to prevent the spread of notorious wood pests from imported products. While these types of exchanges might have happened before NAFTA, the fact that NAFTA has so many specific requirements for “trade legal” SPS gives the non-domestic entities significant leverage.

Second, it shows that the U.S. government, in commenting on Mexico’s proposed SPS, focused only on the problems the standard would pose for U.S. commercial interests (in this case the U.S. lumber industry), apparently ignoring the potential adverse environmental or human health effects of the standard (in this case, fumigation with methyl bromide). While the lack of attention to these issues is not necessarily a direct result of NAFTA, it does illustrate how, under the current system, the focus of government efforts related to standards issues will be on trade effects, not on accompanying environmental or human health effects.

B. Technical Barriers to Trade (Including Labeling)

NAFTA also limits the ability of governments to adopt standards relating to the quality or characteristics of a product, the way the product is produced, and labeling of a product. These NAFTA rules are wide-ranging and complex. (See Box 3-2). The provisions apply to standards that may “directly or indirectly” affect trade in goods or services. They apply to national standards, but also require national governments to ensure that standards adopted by states or provinces and “non-governmental standardizing bodies” comply with the provisions of Chapter 9 (Article 902).¹¹ The countries’ “rights and obligations” under GATT/WTO Agreement on Technical Barriers to Trade (TBT) are expressly recognized as binding.

Article 904 sets out the basic rights and obligations of the NAFTA partners with respect to technical standards. This article affirms the countries’ basic rights to adopt standards that are necessary to protect human, animal or plant life or health, the environment or consumers, and “legitimate objectives” of standards specifically include “sustainable development.”¹² Nevertheless, Chapter 9 imposes a host of substantive conditions on the adoption and implementation of such standards. For example, the standards must adhere to “national treatment” and “most favored nation” principles; must not pose an “unnecessary obstacle” to trade between the parties; should be based on international standards unless specific conditions require otherwise; and “to the greatest extent practicable” be compatible with standards in the other NAFTA countries. Article 907 defines elements of “risk assessments” used to set standards. The chapter also has several provisions for opening the standards setting process to interests from the other NAFTA countries.

¹¹ A standardizing body is a body having “recognized activities in standardization.” Article 915.

¹² Article 915, definition of “legitimate objective”.

Box 3-2. Provisions of Article 904 of NAFTA on Standards

Article 904: Basic Rights and Obligations

Right to Take Standards-Related Measures

1. Each Party may, in accordance with this Agreement, adopt, maintain and apply standards-related measures, including those relating to safety, the protection of human, animal and plant life and health, the environment, and consumers, and measures to ensure their enforcement or implementation. Such measures include those to prohibit the importation of a good of another Party or the provision of a service by a service provider of another Party that fails to comply with the applicable requirements of such measures or to complete its approval procedures.

Right to Establish Level of Protection

2. Notwithstanding any other provision of this Chapter, each Party may, in pursuing its legitimate objectives of safety or the protection of human, animal or plant life or health, the environment, or consumers, establish the levels of protection that it considers appropriate in accordance with Article 907(3).

Non-Discriminatory Treatment

3. Each Party shall, in respect of its standards-related measures, accord to goods or service providers of another Party:

(a) national treatment in accordance with Article 301 (Market Access) or Article 1202 (Cross-Border Trade in Services); and

(b) treatment no less favorable than that it accords to like goods, or in like circumstances to service providers, of any other country.

Unnecessary Obstacles

4. No Party may prepare, adopt, maintain or apply any standards-related measure with a view to or with the effect of creating an unnecessary obstacle to trade between the Parties. An unnecessary obstacle to trade shall not be deemed to be created if:

(a) the demonstrable purpose of such measure is to achieve a legitimate objective; and

(b) such measure does not operate to exclude goods of another Party that meet that legitimate objective.

What these provisions mean for various standards applicable to forest and forestry products industries is not fully settled (Goldman et al 1999; Sizer et al 1999, 7, 11). From the NAFTA text it would appear that a move by one country to ban imports of timber that was not produced in a sustainable manner would probably be subject to a challenge, even if the country required sustainable production in domestic forests. If GATT/WTO jurisprudence is any guide, such a challenge could be successful. For example, in 1998, a WTO panel held that the U.S. law prohibiting imports of shrimp from countries that had not been certified as having a program to require the use of turtle excluder devices (TEDs)¹³ or comparable protections for shrimp harvesting violated GATT provisions (WTO 1998). The panel also found that the Article XX exceptions of GATT (which allow countries to adopt standards to protect human, animal or plant life or health or to conserve exhaustible natural resources) did not provide an exception for the shrimp import prohibition. The panel concluded, essentially, that Article XX did not allow a country to condition access to its markets on the adoption of certain conservation policies by an exporting country.¹⁴

But the jury is still out on labeling measures, especially those that relate to how a product is produced, versus those relating to physical or other aspects of the product itself (WTO 2000; Sizer et al 1999, 11). Labeling measures that just apply to the physical or other aspects of the product should be “trade-legal” if they do not discriminate between domestic and imported products. It is much less clear whether, for example, a government *requirement* that wood be labeled as to whether or not it is sustainably produced (in accordance with some set of sustainable forestry standards) would be “trade-legal” under Chapter 9 of NAFTA or related GATT/WTO rules and jurisprudence. Commercial interests may argue that such “process/production method” (PPM) requirements violate GATT’s TBT Agreement (and Chapter 9 of NAFTA) because they pose an “unnecessary obstacle” to trade (even if they apply to domestic products as well).

A government could mandate that wood and wood products be labeled regarding how the wood is harvested or how the forest the wood came from is managed. Such a requirement would be very useful in promoting expanded consumer awareness and increasing the impact of ecolabeling programs, such as the Forest Stewardship Council’s certification and labeling program. But there is potential for such a requirement to be challenged as trade-illegal, either because it illegally discriminates against “like products” from an importing country; because it poses an “unnecessary obstacle to trade” or—if GATT rules govern—because PPMs are generally disfavored under GATT (Goldman et al 1999).

As some commentators have noted, if such a requirement was found to violate NAFTA or other trade agreements, the incentive for use of voluntary ecolabeling programs could be reduced (Sizer et al 1999, 11). Nevertheless, voluntary labeling—as opposed to government eco-labeling programs—should be less vulnerable to challenge under NAFTA or related GATT/WTO provisions.

There are other potential implications of NAFTA for government efforts to require more sustainable forest management. For example, a recent draft study by the Asian Pacific Economic Council (APEC) on non-tariff barriers to forest trade actually argued that forest conservation measures such as restrictions on

¹³ Under U.S. law, U.S. shrimpers are required to use TEDs to help protect endangered sea turtles. The TEDs help keep turtles out of the shrimping nets, thus reducing mortality rates.

¹⁴ For a summary of the background to the Shrimp decision and current status of the U.S. response (as of May 2000) see Government of Australia. 2000. *U.S. Shrimp Import Ban: Public Information Paper*. Canberra, Australia. Department of Foreign Affairs and Trade, Trade Negotiations Division. Available at http://www.dfat.gov.au/trade/negotiations/environment/us_shrimp_update.html. Similarly, a 1991 GATT panel decision (which was never formally adopted) held that the U.S. import prohibition on tuna that had not been caught in a “dolphin-safe” fashion could not stand under GATT rules. The U.S. and Mexico, the country that had challenged the ban, negotiated a resolution. That GATT panel decision did, however, seem to uphold the use of a “dolphin-safe” labeling system for tuna, as long as that system was applied equally to domestic and imported products.

logging are “a threat to the global trading system” (Sizer et al 1999, 7). As suggested by one analysis: “Such expansive definitions of “trade-distorting” non-tariff measures, based on extreme applications of standard trade policy principles and terms of analysis, suggest that the current framework of trade rules and policies may pose a risk to forest conservation laws.” (Sizer et al 1999, 7). Thus, for example, would it be possible for U.S. timber interests to convince the U.S. government to challenge Mexico’s environmental requirements for forest management plans if those requirements limited timber harvest in ecologically-sensitive areas? While this might sound far-fetched now, given the state of NAFTA/GATT/WTO jurisprudence, some of the arguments being made in the WTO context appear to indicate that these types of challenges may be raised (at least behind closed doors, if not in “official proceedings”).

C. Investment Provisions

Recently, some very troublesome cases have arisen under the investment provisions of Chapter 11 of NAFTA. Briefly, several companies have used the provisions of Chapter 11 that allow private companies to bring actions against NAFTA governments to seek compensation for a variety of actions by the host government, from lack of “fairness” and due process to “expropriation” without compensation (Mann et al 1999). These claims are resolved in secret arbitration proceedings with no public participation. For example, a U.S. hazardous waste company, Metalclad, brought a Chapter 11 action against Mexico for damages allegedly resulting from the decision of a local government in Mexico to prohibit operation of Metalclad’s hazardous waste landfill, after the company had obtained federal permits. In late August 2000, the arbitration panel awarded Metalclad almost \$ 17 million (DePalma, 2000).

Especially in the wake of the Metalclad ruling, U.S. or Canadian forestry investors operating in Mexico could use these Chapter 11 provisions to challenge denial of forestry extraction permits or logging limits. Whether or not such a challenge would succeed depends on the facts of the particular case, but just the ability to bring these high-dollar damage claims is likely to have a chilling effect on how forestry regulations are developed and enforced.

Article 1114 of NAFTA was touted as one of the “green” provisions of NAFTA. It provides that countries *should not* waive or “otherwise derogate from” their environmental standards in order to encourage or retain investment. But the language is merely oratory and, unlike the provisions for investors, there is no cause of action or dispute resolution process for non-governmental groups who believe a country may not have complied with Art. 1114.

D. Government Procurement Requirements

Federal, state and local governments have increasingly begun using their procurement processes to help develop markets for sustainably produced goods. With respect to wood and wood products, these actions can take the form of recycled or post-consumer waste content for paper, prohibitions on the use of certain types of wood in government projects or bid-advantages for projects that will use sustainably harvested wood. NAFTA rules on government procurement processes, however, may pose a barrier to this strategy, at least at the federal government level.

Chapter 10 of NAFTA applies to government procurement process. At this time, it applies only to federal processes, though states may be included in the future (Article 1024). Article 1007 provides that technical specifications used in goods procurement cannot create “unnecessary obstacles” to trade. The term “unnecessary obstacles” is not defined. Article 1007 further provides that the technical standards for

procurement should be based on “performance criteria” not “design or descriptive” characteristics and should be based on international standards “where appropriate”.¹⁵

Article 1018 provides that the procurement measures “necessary to protect human, animal or plant life or health” are exempt from the foregoing requirements, as long as they are not a “means of arbitrary or unjustifiable discrimination” between Parties or a disguised restriction on trade. Notice that procurement measures designed to protect the environment or conserve natural resources (e.g. sustainable wood requirements or recycled content requirements) are not exempt from the Chapter 10 requirements.

If government procurement processes designed to favor sustainably-produced wood or wood products were to be subject to successful challenge under NAFTA, it would hamper the ability of governments to help create markets for sustainable products. This could be especially damaging in a country like Mexico where advantageous or preferential access to the government market could make or break efforts to implement sustainable forestry practices, particularly at the community forestry level.

E. Subsidies and Countervailing Duties

Forestry production—and production of wood products—can be subsidized by governments in a variety of ways (Sizer, et al 1999, 11), including government-constructed roads, direct assistance to the timber or wood products industries, low fees for access to government-owned timber and, at least indirectly, weak or un-enforced forest management or environmental regulations. Under NAFTA, the basic remedy for a government that is concerned that a trading partner is unduly subsidizing an industry is to impose “countervailing duties” on imports. Article 19 of NAFTA lays out specific procedures for resolution of disputes over countervailing duties.

In addition to NAFTA’s provisions, since all three North American countries are members of the WTO, the legality of countervailing duties imposed in response to alleged subsidies may be decided under the WTO Agreement on Subsidies and Countervailing Measures (the SCM Agreement).¹⁶ This agreement limits the types of subsidies for which CVD can be imposed. Maybe most important is the limitation of the definition of “subsidy” to those that involve a “financial contribution” from the government to an enterprise or set of enterprises, as opposed to other types of government intervention that could be considered a subsidy. The SCM Agreement prohibits certain types of outright subsidies (export subsidies and local content subsidies), with a transition period for developing countries such as Mexico and specifies various threshold tests for subjecting other subsidies to CVD.

In the context of the present analysis, we note that two Mexican programs provide subsidies for forestry production: PRODEPLAN and PRODEFOR. The details of these programs are described in Chapter 2. PRODEPLAN, which offers direct subsidies and tax incentives for establishment of commercial plantations appears to be open to both domestic and foreign companies operating in Mexico. No PRODEPLAN subsidies have been provided in Chihuahua, as far as the authors can determine. The PRODEFOR subsidies are primarily directed at improving the efficiency of ejido forestry operations.

IV. THE NAFTA ENVIRONMENTAL SIDE AGREEMENT

There are several provisions of the NAFTA Environmental Side Agreement that potentially relate to government policy decisions having an impact on forestry management. The objectives of the side agreement, set out in Article 1, include promoting sustainable development, but also include “avoid

¹⁵ Article 1003 further provides that the principles of national treatment and most-favored nation apply to government procurement processes in the NAFTA countries.

¹⁶ A summary of this agreement is available at http://www.wto.org/english/tratop_e/scm_e/scm.htm.

creating trade distortions or trade barriers.” As shown above, there may be substantial conflict between these two objectives with respect to forestry management, depending on the interpretation of what constitutes a “trade distortion” or “trade barrier”.

Article 2(1)(e) allows the Commission for Environmental Cooperation to “assess environmental impacts”. Also, under Article 10(2), the Council of the CEC may consider and develop recommendations on “environmental matters as they relate to economic development” and on eco-labeling. These are important cornerstones for potential CEC involvement in a more in-depth examination of the effect of NAFTA on forestry management—not only in Chihuahua, but also throughout North America. Such an examination could proceed under Article 13 of the agreement. This provision allows the CEC Secretariat to prepare a report on any matter “within the scope” of the annual work plan and, unless vetoed by a two-thirds vote of the Council, on any other matter except the effectiveness of environmental law enforcement.¹⁷

Three other provisions of the NAFTA side agreement are relevant to forestry. First, under Article 10(6), the CEC is to cooperate with the NAFTA Free Trade Commission, acting as a “point of inquiry” on disputes with an environmental aspect, playing a role in any consultations under Article 1114 of NAFTA, and assisting in the prevention and resolution of environmentally-related trade disputes. Thus, the CEC would likely have a role to play in any forestry-related trade disputes that reach a government consultation or dispute level. Some commentators have also suggested that the CEC should also play a much more active role in investor-state disputes under Chapter 11 of NAFTA (Mann 1999).

Second, Article 10(7) provides that the CEC is to develop an agreement on assessing transboundary environmental impacts. That accord was supposed to be completed within 3 years of the side agreement’s enactment, though that deadline has not been met. An assessment of transboundary impacts could be important, however, for large-scale forestry projects in Chihuahua that could affect transboundary surface waters (e.g. the Rio Conchos, which is the major tributary to the binational Rio Grande.)

Finally, Articles 14 and 15 of the side agreement establish procedures for citizen submissions alleging that a NAFTA government has failed to effectively enforce its environmental laws. The CEC can respond to such submissions through the preparation of a “factual record”.¹⁸ Forest management laws and regulations, however, are specifically excluded from the Article 14/15 process. Article 45(2)(b) provides that the term “environmental law” does not include “any statute or regulation, or provision thereof, the *primary purpose* of which is managing the commercial harvest or exploitation, or subsistence or aboriginal harvesting, of natural resources.” (emphasis added). Nevertheless, a citizen submission dealing with failure to effectively enforce environmental laws which apply to the effects of forestry on water quality or endangered species should be possible.

In fact, the CEC has received at least three citizen submissions focusing on forestry issues. The first, filed by Sierra Club and others, challenged the salvage-logging rider adopted by the U.S. Congress in 1995. That submission was dismissed for lack of jurisdiction, as the CEC Secretariat concluded it did not have authority to review legislative action (CEC 1998, 79-85). The second was filed by the David Suzuki Foundation in 2000. This submission alleges a general failure to effectively enforce the Canadian Fisheries Act with respect to logging operations in British Columbia.

¹⁷ The governments are obligated, under Article 5 of the side agreement, to “effectively enforce” their environmental laws, including publicly releasing “non-compliance information” and securing timely remedies for violations. These two obligations are at the heart of the forestry-related Article 14/15 citizen submissions to CEC (see below).

¹⁸ See <http://www.cec.org/citizen> for more information on the citizen submission process.

The third submission, which was filed in June 2000, relates directly to the environmental aspects of forestry operations in the state of Chihuahua. Filed by the Centro de Derecho Ambiental del Noreste de Mexico (CEDANEM) (now Fuerza Ambiental, A.C.) and others, the submission alleges that Mexico has repeatedly failed to enforce environmental requirements applicable to logging operations in the Sierra Tarahumara and failed to respond to citizen complaints. Processing of this submission has just begun. The complaints are discussed in more detail in Chapter 5.

V. NAFTA INSTITUTIONS

A. Commission for Environmental Cooperation

The CEC does not currently have specific programs related to forestry management or protection. Nevertheless, some aspects of existing CEC programs do relate, at least indirectly, to forest protection, including those for conservation of Important Bird Areas (IBAs) and protection of biodiversity. Mexico has designated an IBA in the southern part of the Sierra Madre, near the Durango border, for protection of Thick-billed parrots, Mexican spotted owls and other threatened birds (Nabhan 1997). And, as mentioned earlier, the un-cut areas of the Sierra have a high degree of biodiversity and endemic species, as well as a wide variety of useful medicinal plants.

B. Free Trade Commission

The authors have not been able to locate any cases or issues where NAFTA's Free Trade Commission—or its subsidiary bodies such as the Committee on Sanitary and Phytosanitary Standards (SPS) or the Committee on Agricultural Trade—have examined aspects of Mexico's forestry industry or environmental regulations applicable to that industry.¹⁹

VI. A NOTE ABOUT EXPORT PROMOTION

At least one indirect effect of NAFTA has been to focus U.S. government agencies and U.S. industry on promoting exports of U.S. products to Mexico. In the wood products area, the U.S. Department of Agriculture's Foreign Agricultural Service (FAS) provides U.S. industry with detailed analyses of the Mexican market for wood and of competition from Mexican sources. In at least one aspect of its export promotion activities—promoting the increased use of wood for timber frame housing in Mexico—the FAS appears to have largely ignored environmental concerns. In its 1999 analysis of U.S./Mexico trade in wood and wood products (Juarez 1999), the FAS states that the “lack of a wooden house ‘culture’ in Mexico continues to inhibit consumption of lower grade construction lumber. A key factor is the Mexican “perception” that homes constructed with wood are more expensive and less durable than homes built of traditional masonry materials [such as adobe and concrete block, which are used extensively in Mexico.]” The FAS quotes an industry study that favors a “massive educational campaign stressing the advantages of solid wood products for constructing homes as compared to traditional materials, and addressing the often false perception regarding its disadvantages.” The FAS report does not recognize that traditional materials such as adobe and concrete may, in fact, be more durable, pest-resistant and lower cost than timber-frame housing in Mexico, nor does it even broach the fact that a substantial switch to timber frame housing would put incredible new pressure on U.S. forests, as well as on Chihuahuan pine forests.

¹⁹ For a description of these institutions, see Commission for Environmental Cooperation. 1997. *NAFTA's Institutions: The Environmental Potential and Performance of the NAFTA Free Trade Commission and Related Bodies*, Montreal.

The authors raise this issue to demonstrate that some *indirect* impacts of NAFTA, especially in the export promotion realm, can have substantial environmental implications. Yet there are few safeguards that would ensure environmental considerations are integrated into such programs.

III. CONCLUSIONS

1. Pre-NAFTA tariffs on wood and wood products are reduced to zero under NAFTA, though most U.S. and Canadian tariffs were already at or near zero and Mexican tariffs were not very high (0 to 15% in most cases).
2. NAFTA's provisions regarding non-tariff trade barriers may adversely affect the ability of Mexico to create and/or foster markets for sustainably produced wood and wood products. This is particularly true with respect to the technical standards provisions of Chapter 9 and the government procurement provisions of Chapter 10. Much depends on the interpretations of ambiguous provisions in the NAFTA text and developing WTO "jurisprudence" may influence these interpretations. While wholly voluntary certification programs for sustainably produced wood are not likely to be significantly affected by these provisions, options to use government action to promote the programs and develop markets for the wood are made less viable by NAFTA's provisions on standards.
3. Recent interpretations of the investment provisions of NAFTA Chapter 11, particularly the Metalclad case, pose a substantial threat to Mexico's ability to adequately regulate forestry or forestry product operations of companies from the U.S. and Canada.
4. While not necessarily a direct *result* of NAFTA, it does not appear that environmental and natural resource considerations are at all integrated into the actions of the U.S. agencies responsible for monitoring and promoting exports of wood to Mexico.
5. The CEC has authority, within and in addition to current program areas, to take a more active role in addressing some of the adverse environmental impacts of post-NAFTA forestry operations in the Sierra Tarahumara.

Chapter 4. The Forestry and Paper Industries in Chihuahua Post-NAFTA

With respect to the forestry sector, Mexico's entry into NAFTA has coincided with modernization and consolidation of the forest products industry in Chihuahua and with increased wood production from the native forests of the Sierra Tarahumara. As shown in Figure 4.1, Mexico's annual forestry production, including production of pine suffered a gradual decline in the early 1990s, reaching its lowest level in 1995, and then beginning to increase steadily from 1996 on. Figures 4.2 and 4.3 show similar trends for forestry production in Chihuahua, with production bottoming out in 1994 and increasing thereafter. Today, Chihuahua is the state with the greatest number of hectares of forest in Mexico and second to Durango in the total value of forest products. In addition, Chihuahua is tied with Durango as the largest producer of pine; each state accounts for 23 % of total pine production.

Figure 4.1. Mexico's Annual Forestry Production 1989-1998

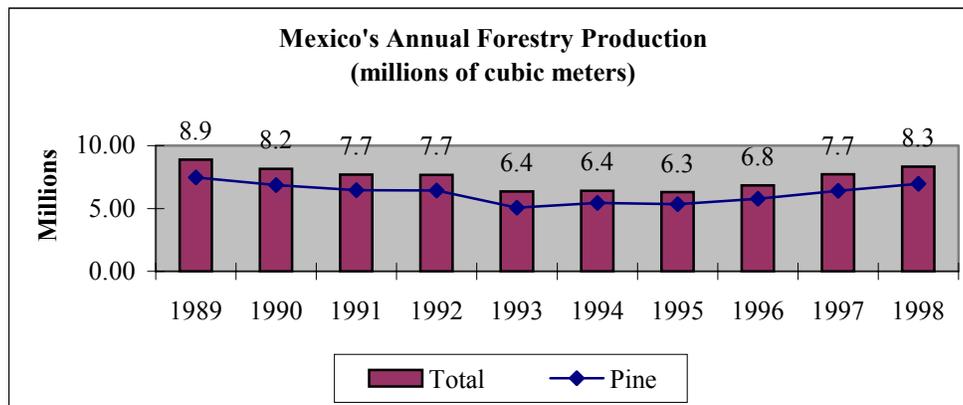


Figure 4.2 Chihuahua's Annual Forestry Production 1989-1998

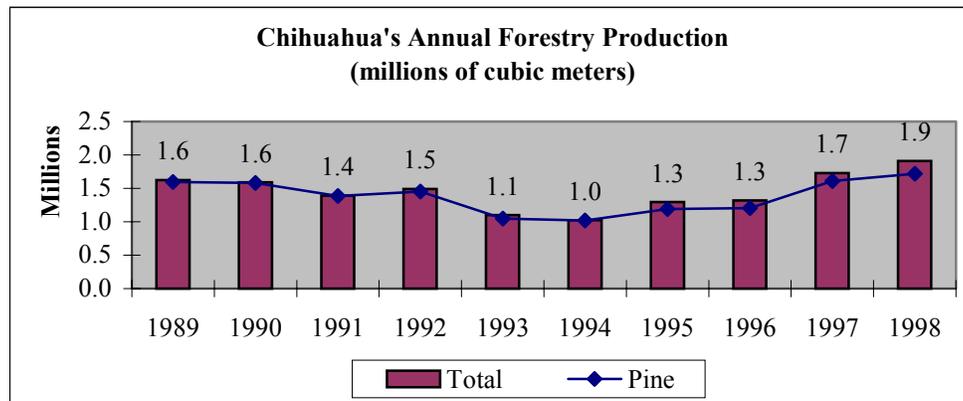
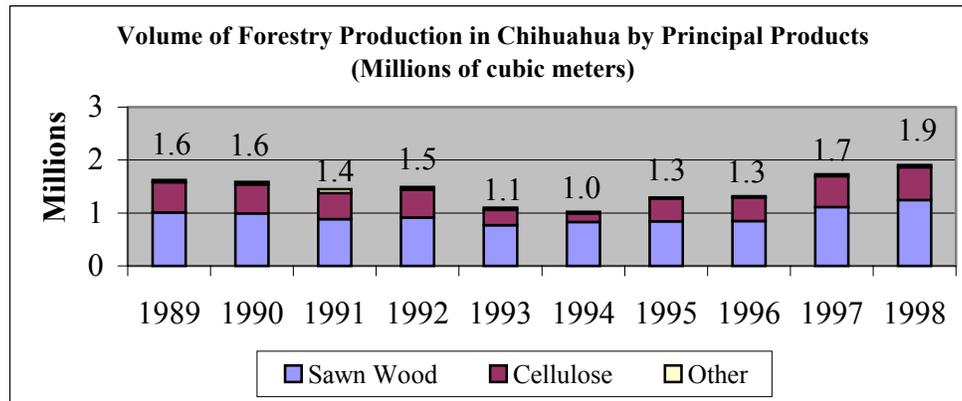


Figure 4.3. Volume of Forestry Production in Chihuahua by Principal Products 1989-1999



I. TRENDS IN POST-NAFTA TRADE IN FORESTRY PRODUCTS

This section analyzes trends in the imports and exports of wood and wood products during the period from 1993 to 1999.²⁰ The intent is to examine the relationship between these trade trends and wood harvesting practices in the natural forests of the Sierra Madre of Chihuahua.

The analysis examines trade flows (imports, exports and production from primary producer states, including Chihuahua) for products in three major wood and wood products categories under the International Harmonized Tariff Schedule:

- Chapter 44: wood and articles of wood and wood charcoal;
- Chapter 47: pulp of wood or other fibrous cellulose materials(including recovered paper or paperboard); and
- Chapter 48: paper and paperboard; articles of paper pulp, of paper or of paperboard.

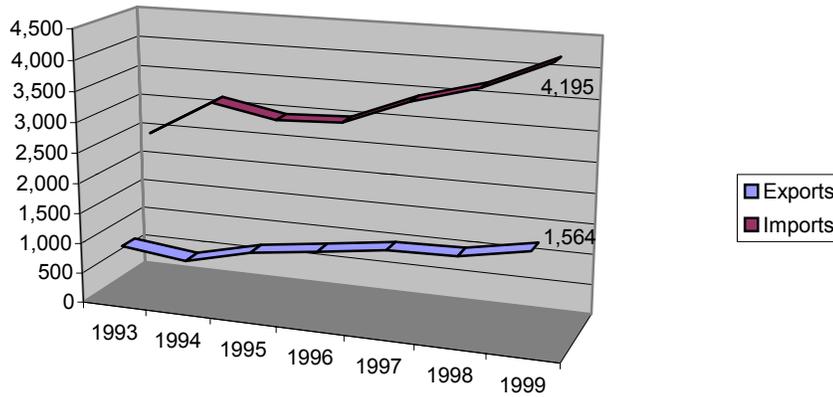
A. Trade Balance in Forest Products

Mexico's overall exports showed a 164% increase between 1993 and 1999, from a base of \$51.8 billion dollars in 1993 to \$136.7 billion in 1999. The total value of imports rose from \$65.4 billion in 1993 to \$142 billion in 1999, which corresponds to a 117 % increase. Thus, Mexico continues to have an overall trade deficit, though it now has a \$11.9 billion trade surplus with the U.S.

Mexico had an overall negative trade balance in forest products during the 1993 to 1999 period, and the size of the deficit has grown steadily in the last few years. In 1993, wood and wood product exports reached \$917 million, while imports were valued at \$2,545 million, representing a deficit of \$1,628 million in products with Chapters 44, 47 and 48 (Figure 4.4 and Table 4.1).

²⁰ This analysis is based on trade statistics from the Mexican Secretaría de Fomento y Comercio Industrial (SECOFI) and Mexico's Banco de Comercio Exterior (Bancomext).

**Figure 4.4. Mexico's Trade Balance in Forestry Products 1993-1999
(Millions of dollars)**



**Table 4.1. Mexico's Trade Balance in Forestry Products 1993-1999
(Millions of dollars)**

	1993	1994	1995	1996	1997	1998	1999
Exports	917.10	790.04	1,049.21	1,187.86	1,337.58	1,364.27	1,564.22
Imports	2,545.36	3,148.02	2,947.12	2,993.83	3,421.26	3,720.58	4,195.02
	-1,628.26	-2,357.97	-1,897.91	-1,805.97	-2,083.68	-2,356.31	-2,630.80

In 1999, imports of wood and wood products in these categories were valued at \$4,195 million and exports reached \$1,564 million, representing a deficit of more than \$2,630 million. It is expected, based on these trends, that Mexico's trade deficit in forestry products will likely continue to increase in the next few years. Table 4.2 shows that the U.S. and Canada are Mexico's major trading partners for imports of wood and wood products.

Table 4.2 . Principal Countries from Which Mexico Imports Wood and Wood Products

44 wood, articles of wood, and wood charcol		47 pulp of wood or other fibrous cellulose materials		48 paper and paperboard; articles of paper pulp; of paper; or of paperboard	
United States	77.3%	United States	90.77%	United States	88.61%
Indonesia	5.9%	Canada	4.94%	Canada	2.63%
Canada	3.4%	Brazil	2.49%	Spain	.95%
Chile	3.4%	Chile	1.21%	Finland	.92%
Brazil	1.9%	Switzerland	.19%	Germany	.91%

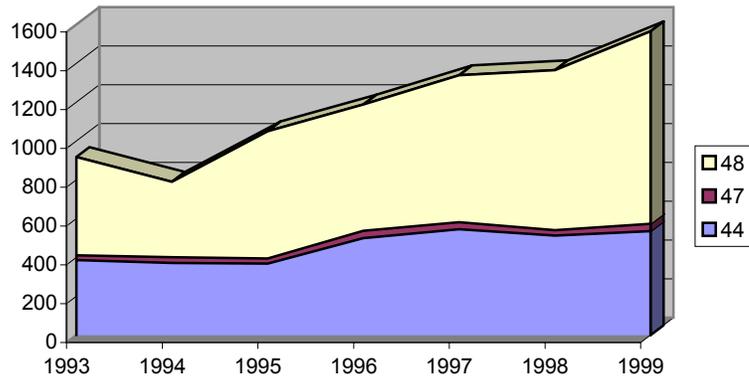
The trade deficit of Chapter 48 products is growing rapidly due to a large increase in imports of paper and paperboard into Mexico. In 1993, the deficit was \$1,088 million; it rose to \$2,115 million in 1999, an increase of over 94%.

B. Trade in Wood and Wood Products

1. Exports of wood and wood products

Figure 4.5 shows the volume of exports of wood and wood products in the chapter 44, 47 and 48 categories, with products in chapter 48 (paper, paperboard and paper and paperboard products) being among the most important.

Figure 4.5. Trends in Mexico’s exports of wood and wood products (millions of dollars)



In 1999, the value of exports of wood and wood products from Mexico totaled \$1,564 million, representing an overall increase of 70.6% from 1993.

Table 4.3. Growth in exports of wood and wood products, by HTS chapter, 1993-1999

44 wood, articles of wood, and wood charcoal	47 pulp of wood or other fibrous cellulose materials	48 paper and paperboard; articles of paper pulp; of paper; or of paperboard
38 %	49%	95.5%

Figure 4.5 and Table 4.3 show that exports of wood and wood products have exploded during the 1993 to 1999 time period, especially in the paper and paperboard category, even though the increase has been less than the 164% overall increase in Mexico’s exports during this same period. As discussed in more detail below, exports of some products—including picture frames and mirrors; plywood and veneered panels and sheets (HTS 4408 and 4412)—have increased at a rate greater than the overall national average.

The U.S. was by far the principal destination for exports of wood and wood products from Mexico during the 1993 to 1999 period, as shown in Table 4.4.

Table 4.4. Destination of Mexican wood and wood product exports, 1993-1999

44 wood, articles of wood, and wood charcol	47 pulp of wood or other fibrous cellulose materials	48 paper and paperboard; articles of paper pulp; of paper; or of paperboard
United States 96%	United States 96.61%	United States 84.5%

Due to its forest resources, wood product processing industry and geographic location, Chihuahua leads all Mexican states in exports of wood and wood products in HTS chapters 44, 47 and 48. Table 4.5 shows how Chihuahua's exports of these products ranks in comparison to those from other states.

Table 4.5. Participation of the principal wood exporting states (Millions of dollars)

44 wood, articles of wood, and wood charcol	47 pulp of wood or other fibrous cellulose materials	48 paper and paperboard; articles of paper pulp; of paper; or of paperboard
Chihuahua 118.0	Chihuahua 14.2	Chihuahua 286.0
Baja California Norte 68.6	No state specified ²¹ 13.9	No state specified 271.4
Tamaulipas 33.7	Baja California Norte 3.3	Federal District 126.8
Durango 28.3	Sonora 2.8	Baja California Norte 78.8

2. Analysis of Exports by HTS Chapter

a. Wood, articles of wood; wood charcoal—Chapter 44

The value of Mexico's exports of Chapter 44 products grew 38.5% during the study period, from \$ 387 million in 1993 to about \$ 536 million in 1997. Exports of these products reached a level of \$ 546 million in 1999. Figure 4.7 shows trends with respect to five of the most important products included in Chapter 44.

²¹ Export statistics show a considerable portion of the exports as not registered to a particular state.

Figure 4.6. Trends in Exports of Products in Chapter 441993-1999 (Millions of dollars)

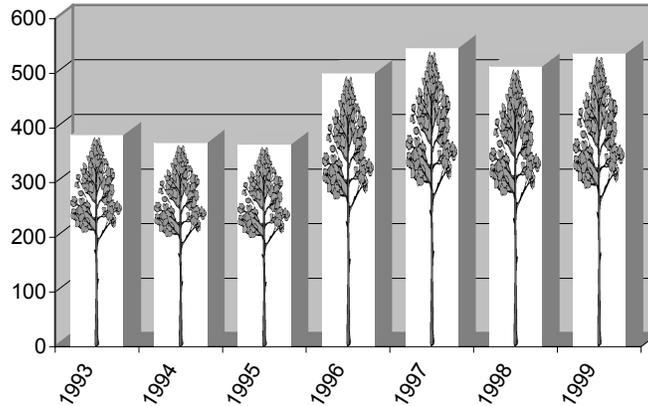
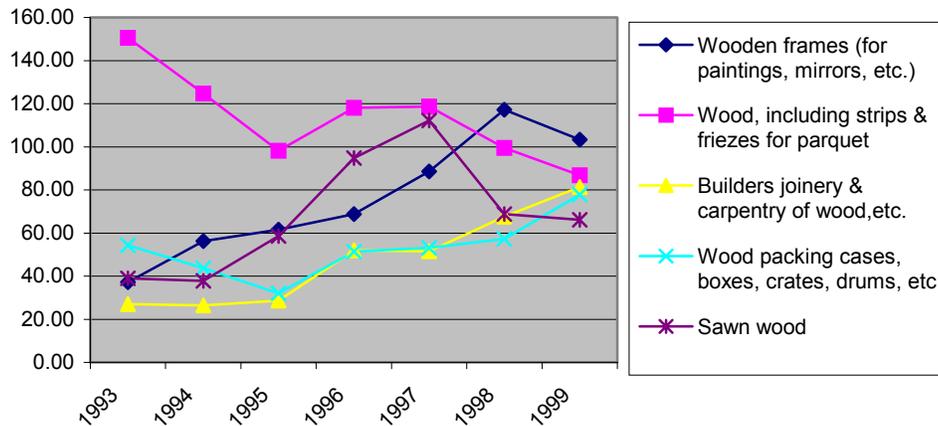


Figure 4.7. Trends in Mexican exports of 5 products in Chapter 44, 1993-1999 (Millions of dollars)



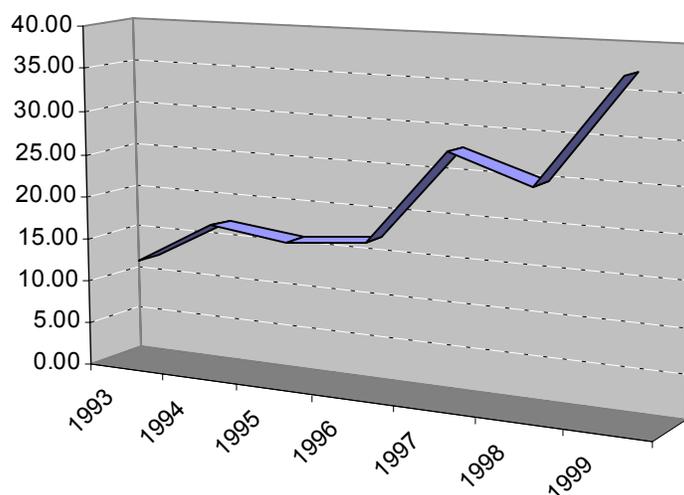
Exports of wooden frames for paintings, mirrors etc. (HTS 4414) increased 177% over 1993 levels, to reach a total of \$ 103.25 million. Exports of products in HTS 4409, which includes wood for parquet flooring, decreased 42.4 % from a high of \$ 150.6 million in 1993 to \$ 86.8 million in 1999.

The value of plywood and veneer panel exports (HTS 4412) increased from \$1.1 million in 1993 to \$9.5 million in 1999, an increase of 450%, but a value much lower than the other types of products. Other products for which the value of exports increased during the 1993 to 1999 time period were veneer sheets and sheets for plywood (HTS 4408), with a growth of about 546% and hoopwood, split poles and wood stakes (HTS 4404), with a growth of 661%, reaching a value of \$140 million in 1999.

b. Pulp of wood or other fibrous cellulose material (Chapter 47)

Recovered (waste and scrap) paper and paperboard (HTS 4707) accounts for over 99% of all Mexican exports in HTS Chapter 47. Trends in exports of these products are shown in Figure 4.8. The value of exports in this category grew from \$ 12.4 million in 1993 to \$37.2 million in 1999, an increase of more than 200% in just six years.

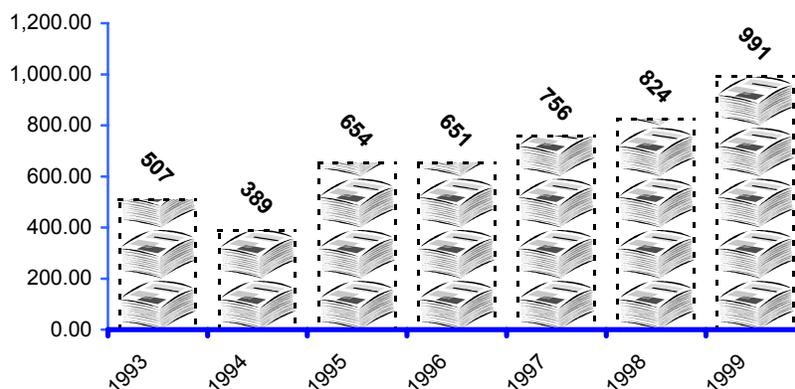
Figure 4.8. Trends in exports of recovered paper and paperboard (HTS 4707) 1993-1999 (Millions of dollars)



c. Paper and paperboard; articles of paper pulp, paper or paperboard—Chapter 48

The value of Mexico's exports of products encompassed in HTS Chapter 48 increased almost 96% between 1993 and 1999, growing from \$506.6 million in 1993 to \$991 million in 1999. This trend is shown in Figure 4.9.

Figure 4.9. Trends in Exports of HTS Chapter 48 products 1993-1999 (Millions of dollars)



In 1999, the products shown in Table 4.6 together accounted for over 94% of HTS Chapter 48 exports. Toilet paper and tissues (HTS 4818) represented 43% of the value. In this category, exports from Chihuahua accounted for \$ 220 million (more than 51% of the total).²² About 85% of the exports in this category were destined for the U.S.

²² In this category, exports not registered to a particular state accounted for almost 27% of the total exports, making full assessment of Chihuahua's participation difficult.

Table 4.6. Exports of Products in HTS Ch. 48. 1999 (Millions of dollars)

HTS Code	Description	1999
	TOTAL	\$ 991,017,292
4818	Paper used for various household, sanitary uses	430,939,420
4820	Registers, account books, notebooks, etc.	167,063,623
4819	Paper/paperboard cartons, boxes, etc.	148,069,095
4823	Other paper/paperboard products; adhesive paper	67,061,459
4803	Stock for various tissues, paper towels, etc.	58,365,246
4810	Kaolin-coated paper and paperboard	18,947,541
4801	Newsprint, in sheets or rolls	14,829,548
4802	Uncoated paper and paperboard	14,467,917
4821	Paper and paperboard labels	14,392,042

3. Imports of Wood and Wood Products

Imports of wood and wood products into Mexico increased over 65% between 1993 and 1999, with the fastest growth coming in imports of paper and paperboard and associated products (HTS Ch. 48).

In 1999, paper and paper products (HTS Ch. 48) accounted for 74 % of the imports into Mexico of products in HTS Chapters 44, 47 and 48. Figure 4.10 shows import trends from 1993 to 1999 and Figure 4.11 shows the composition of imports in 1999.

Figure 4.10. Imports of Wood and Wood Products Into Mexico (HTS Ch. 44, 47 & 48) 1993-1999 (Millions of dollars)

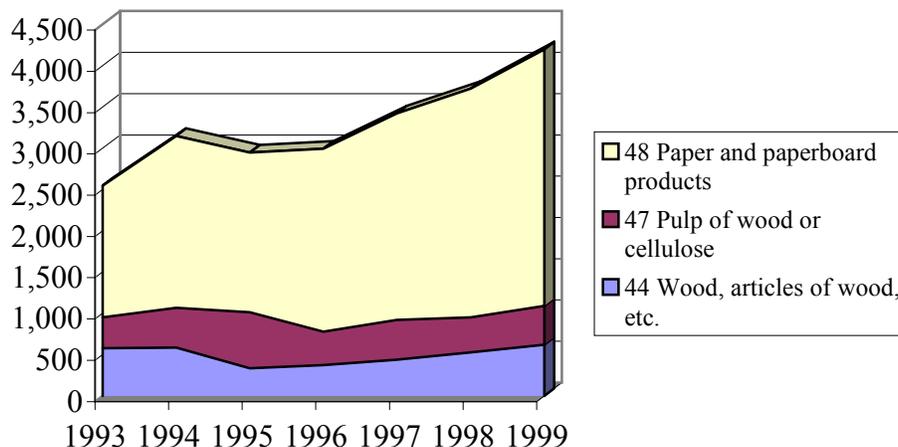
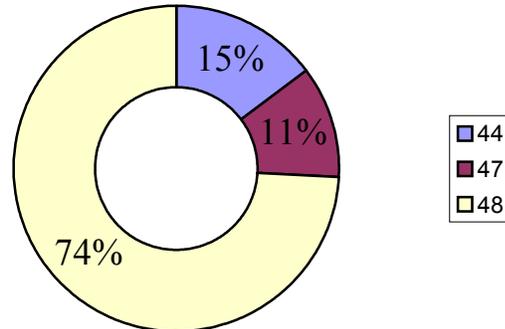


Figure 4.11. Relative Composition of Imports by HTS Chapter 1999
Total: \$ 4,195 million (\$ U.S.)



II. POST-NAFTA CHANGES IN FORESTRY AND FORESTRY PRODUCTS INDUSTRY IN CHIHUAHUA

A. Forest Harvesting

As shown in Table 4.7, the number of forest harvesting permits, as well as the authorized volume of wood to be harvested from Chihuahua forests has increased since 1993. INEGI data for Chihuahua indicate that for 1998 only about 45% authorized was actually harvested (1.157 million cubic meters of 2.517 million cubic meters authorized). However, other data from SEMARNAP show a production of about 1.9 million cubic meters in 1998 (SEMARNAP B 1999). None of these figures accounts for illegal harvesting of wood. PROFEPA has estimated that on a national basis illegal cutting is reaching about 50% of authorized volumes. If that figure were applied to Chihuahua, the 1998 annual harvest would total about 3.77 million cubic meters.

Table 4.7. Authorized Forestry Permits and Harvest Amounts—Chihuahua

Item	1993	1997	1998
Forestry permits	576	726	759
Wood authorized (cubic meters)	2.33 million	2.45 million	2.517

Sources: INEGI 1994, 1998 and 1999.

C. Forest Products Industries

According to SEMARNAP, the Chihuahua forest products industry consists of 441 enterprises, including over 300 sawmills. Many of these facilities are small, marginal operations, producing at well below their installed capacity, but Chihuahua also has some of the largest paper and cellulose plants in Mexico. Two post-NAFTA trends are important: (1) a large increase in the number of sawmills, particularly private mills and (2) a consolidation of pulp and paper production brought about by the participation of two large multinational corporations: COPAMEX and Grupo Industrial Durango, S.A. (GIDUSA). These developments are discussed below.

1. Sawmills

Private sawmills have grown at an incredible pace in Chihuahua—215 percent over the period of 1993 to 1998. In 1993, there were about 108 sawmills in the state (43 on ejido lands and 65 private mills). By 1998, there were 309 sawmills, with 104 on ejido lands and 205 private mills, indicating the much faster growth of private mills. As the number of private mills grows, forest ejidos become primarily suppliers of raw wood, instead of developing capacity to mill and produce their own higher-value products. The rapid growth of sawmills also increases competition between ejidos and private loggers to find the best wood, in turn exerting massive pressure on the Sierra's forest ecosystems.

2. Pulp and paper production

In 1999 Chihuahua was the leading Mexican state in the production of wood pulp (more than 36 % of chemical pulp) and the fifth largest in terms of paper production (approximately 6 %). See Table 4.8. Most of this production came from large multinational companies that purchased Chihuahuan-based companies in the paper and pulp industries, and to a lesser extent the forest product industry, during the 1990s.

Table 4.8. 1999 Production of Paper and Cellulose in Chihuahua

Category	Total Production in Metric Tons	Percentage of Total Mexican Production	Rank Among Mexican States
Paper	141,479	15.0%	2 nd
Packaging	90,541	4.2%	7 th
All Paper Products	232,020	6.1%	5 th
Wood Pulp	128,552	36.8%	1 st
All Pulp	128,552	23.7%	2 nd

Source: Camara Nacional 2000, 21, 33

In 1999, a single plant in Chihuahua produced more than 128,000 tons of chemical pulp from bleached hardwood and softwood (Camara Nacional 2000, 21). The facility, Celulosa y Papel Ponderosa, or Pondercel, currently has the capacity to produce 144,000 tons of bleached hardwood (short fiber) and softwood (long fiber) pulp at its facility in Anáhuac, Chihuahua, as well as 135,000 tons a year of bond paper per year from the pulp (COPAMEX 2000, 2). This paper is used mainly by the printing and publishing industry and for high-speed copying.

Originally owned by Grupo Chihuahua as part of the consortium Ponderosa Industrial, S.A. (PISA), Celulosa y Papel Ponderosa was acquired by COPAMEX, a Monterrey-based consortium, in December of 1994.²³ In the process, COPAMEX also acquired the pulp operations as well as several other Chihuahua-based facilities (see Table 4.9). This broad ownership of Chihuahua pulp and paper plants allows COPAMEX to significantly control raw material costs for many of its products (COPAMEX 2000, 2).

COPAMEX is currently one of the largest Mexican producers of paper-based consumer products like bathroom and facial tissue (second only to Kimberly-Clark of Mexico); printing and writing products like bond and cut-sized paper; and industrial paper products, including multi-wall bags mainly for cement companies, corrugated containers and specialty papers. While many of these products rely on recycled,

²³ Labor disputes and other factors had resulted in the closure of this plant in 1994. It was re-opened after being acquired by COPAMEX.

secondary fibers, bond and specialty papers require bleached virgin fibers. According to company reports, the Anáhuac plant provides 59% of COPAMEX's virgin fiber requirements, with the rest imported from U.S., Canadian and Brazilian producers. COPAMEX purchases wood from Mexican ejidos and from its own plantations to feed the PONDERCEL plant, although no information was located on how much of this wood comes from forest ejidos in Chihuahua.

Table 4.9. Plants and annual capacity owned by COPAMEX in Chihuahua, 1999

Name of Plant	Location	Product	Annual Capacity in Metric Tons
Pondercel	Anahuac, Chihuahua	Long and Short-fiber Bleached Pulp	144,000
	Anahuac, Chihuahua	Bond Paper	135,000
Papelera de Chihuahua	Chihuahua, Chihuahua	Kraft Paper, Bond Paper	100,000 26,000
Sacos y Envases Industriales	Chihuahua, Chihuahua	Glued Bag Production	90,000

In 1994, Empresas la Moderna, a subsidiary of the Monterrey holding company Pulsar International, purchased other operations of PISA, including Ponderosa de Chihuahua, Ecofibras Ponderosa, Ponderfibers Corp, Paneles Ponderosa, Paneles Ponderosa and Bosques de Chihuahua. In 1996, Grupo Industrial Durango (GIDUSA), a major forestry and paper products company, purchased the Ponderosa holding company and four forest product companies for \$32 million from Empresas la Moderna. The acquisition provided GIDUSA access to raw material sources in Chihuahua where it previously had not operated.

GIDUSA is believed to be the largest forest products company in Mexico, with a capacity to produce 50,000 tons of plywood, 135,000 tons of particleboard and 6,000 tons of lumber for the furniture and construction industries (GIDUSA 2000, 10, 14). In 1999, the company exported 31 % of its wood and forest products to the U.S. (GIDUSA 2000, 10). In addition, GIDUSA is a major producer of paper and packaging products, mainly producing corrugated containers for industries, including maquiladoras on the U.S./Mexico border. Most of these products use secondary recycled fibers, although some unbleached virgin pulp is used for production of multi-wall sacks and bags. In addition to its Mexican holdings, in 1997 and 1998, GIDUSA purchased McKinley Paper Company, which operates a paper mill in New Mexico and two recycling centers. It also acquired two corrugated container plants in Texas, as well as a sheet plant in Arizona. About 55% of the company's revenue is derived from the Mexican market, with the remainder coming from the U.S. and Canada (GIDUSA 2000,1).

GIDUSA obtains most of its woods from ejidos in Durango, Jalisco and Michoacán, though it is also apparently getting wood from some areas of the Sierra Tarahumara. It obtains most of its pulp from its plant in Durango. The company runs both a corrugated container plant and several forestry product companies in Chihuahua (Table 4.10).

Table 4.10. Plants owned by GIDUSA in Chihuahua

Name of Plant	Location	Product	Annual Capacity in Metric Tons
Cajas y Corrugados de Chihuahua	Chihuahua, Chihuahua	Corrugated Containers	26,000
Ponderosa Industrial	Chihuahua,	Plywood	24,000

de Mexico	Chihuahua		
		Particleboard	120,000
		Resins	24,000

In addition to these companies, Smurfit Carton y Papel de Mexico, another major paper products producer, runs a maquiladora in Ciudad Juárez that makes cardboard products.

In 1995, a subsidiary of U.S.-based International Paper Company attempted to enter the Chihuahuan market by contracting, first through intermediaries and then more directly, with the Ejido San Alonso in the municipality of Urique in the Sierra Tarahumara. The forest permit would have tripled the allowable cut in the ejido and included small diameter young pines (9-15 cm). Thirteen ejidatarios, concerned about this intensity of cutting and the ecological damage it could do, filed a complaint with environmental authorities, and the operations were eventually discontinued.

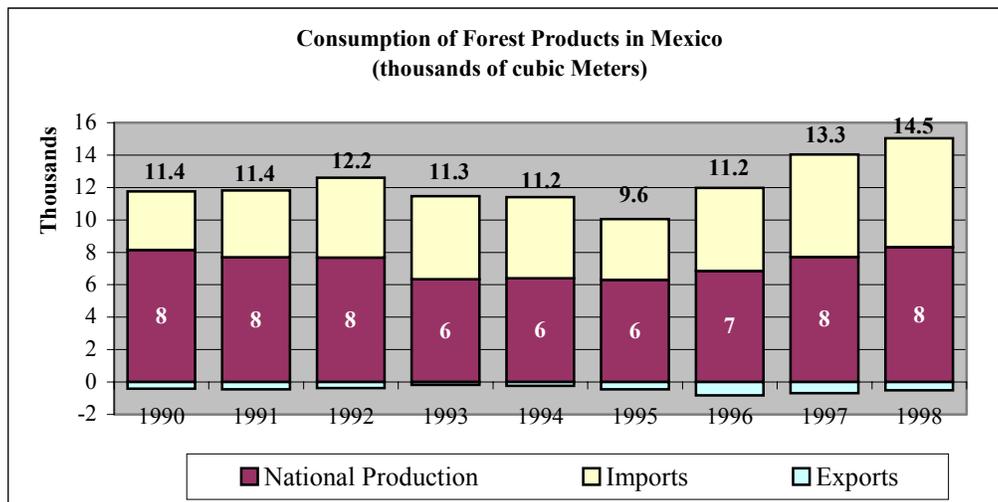
III. KEY FACTORS UNDERLYING POST-NAFTA TRENDS

Based on available information, it appears that the current trends in the forestry and forestry product industries in Chihuahua are being driven as much or more by domestic economic conditions (including the value of the peso), changes in domestic forestry law and industry consolidation than by NAFTA tariff reductions. It should be noted, however, that none of these factors is necessarily unrelated to NAFTA and the generalized neo-liberal and globalization policies to which NAFTA is linked.

As discussed in Chapter 3, most of the U.S. tariffs on forest product imports from Mexico were at or near zero before NAFTA. Thus, although exports of several Mexican (and Chihuahuan) forest products have increased significantly in the post-NAFTA period, it appears that the increases are more linked to international and U.S. paper prices and U.S. demand, at least for Chihuahua producers (GIDUSA 2000, 8, 13).

Production in the Chihuahuan forestry and forest product industries also appears to be highly linked to Mexico's domestic demand for forest products, particularly in the paper, furniture and construction sectors (SEMARNAP A 1999; GIDUSA 2000, 10; COPAMEX 2000; Juarez 1999, 2). As shown in Figure 4.11, consumption of forest products in Mexico has increased sharply since 1996, after a large decrease in 1995 due to the economic crisis triggered by the devaluation of the peso.

Figure 4.11 Consumption of Forest Products in Mexico



Imports are supplying a greater portion of Mexico's demand due to inefficiencies and undercapacity in the Mexican forest product industry (Juarez 1999, 1, 3; SEMARNAP 1999, 2, 3)

In terms of forestry product imports into Mexico and competition with products from Mexican producers, both major companies operating in Chihuahua state that reduction of Mexican tariffs on such imports under NAFTA will not affect their competitiveness (GIDUSA 2000, 9-10; COPAMEX 2000, 5). However, as they struggle to maintain their share of the Mexican market in the face of increasing U.S. imports, Chihuahua paper and forest product companies *are* having to reduce prices to remain competitive (GIDUSA 2000, 7, 9, 35). This could, in turn, mean that these companies will resist new environmental controls or forestry regulations that could increase the costs of the raw wood or increase the costs of their production operations.²⁴ While this is not the traditional "race to the bottom" in terms of the forestry industry moving to a less-regulated country, it could induce the companies to pressure the Mexican government to avoid adoption of stronger regulations or dissuade the government from strong enforcement of existing regulations.

IV. CONCLUSIONS

1. Even as Mexico's trade in wood and wood products has increased during the post-NAFTA period, Mexico still has a large—and growing—trade deficit in wood and wood products.
2. Prior to NAFTA, Mexico's forestry production was primarily for internal consumption (SEMARNAP 1999). Imports began to increase in 1992 and 1993, and in those years there were charges that the U.S. was "dumping" cellulose on the Mexican market and that Chile was dumping wood.
3. Wood production, particularly of pine, has increased substantially in Chihuahua since Mexico's entry into NAFTA, paralleling an increase in both exports of wood and wood products from Mexico and an increase in imports.
4. During this same post-NAFTA period, the wood products processing industry in Chihuahua (primarily cellulose and paper manufacturing) has undergone a restructuring process, passing from reliance on local capital to investment and ownership by transnational corporations. There are signs that the production of paper and paper/paperboard products in Chihuahua is tending toward control by two large transnational corporations, COPAMEX and GIDUSA.
5. Based on available information, it appears that the current trends in the forestry and forestry product industries in Chihuahua are being driven as much or more by domestic economic conditions (including the value of the peso), changes in domestic forestry law and industry consolidation than by NAFTA tariff reductions. It should be noted, however, that none of these factors is necessarily unrelated to NAFTA and the generalized neo-liberal and globalization policies to which it is linked.
6. In terms of forestry product imports into Mexico and competition with products from Mexican producers, both major companies operating in Chihuahua state that reduction of Mexican tariffs on such imports under NAFTA will not affect their competitiveness. However, as they struggle to maintain their share of the Mexican market in the face of increasing U.S. imports, Chihuahua paper and forest product

²⁴ GIDUSA notes that "Were enforcement of existing [environmental] laws to increase, or were new environmental laws to be enacted, Durango could incur additional compliance costs, which could be material." (GIDUSA 2000, 17). COPAMEX states that "[h]istorically, Mexico's environmental laws have not been enforced as vigorously as have environmental laws in the United States...[after NAFTA] we cannot assure you that our operations will not be subject to more strict Mexican federal or state environmental laws or more strict interpretation or enforcement of those laws in the future." (COPAMEX 2000, 14)

companies *are* having to reduce prices to remain competitive. This could, in turn, mean that these companies will resist new environmental controls or forestry regulations that could increase the costs of the raw wood or increase the costs of their production operations.²⁵ While this is not the traditional “race to the bottom” in terms of the forestry industry moving to a less-regulated country, it could induce the companies to pressure the Mexican government to avoid adoption of stronger regulations or dissuade the government from strong enforcement of existing regulations.

7. Chihuahua is the leading wood products exporting state in Mexico and is second only to Durango in wood production. The installed capacity of the cellulose and paper plants in Anahuac may be greater than the annual harvest of wood in Chihuahua, indicating that these plants would likely to receive wood from others areas of Mexico and from outside Mexico if they were to produce at full capacity.

8. The increased demand for wood has served to promote intensive cutting of the Sierra Madre forests and has also apparently increased illegal cutting, as discussed in more detail in Chapter 5.

9. The authors have not been able to locate any studies evaluating the effect of increased wood harvesting on the productive potential of the Chihuahua forests.

²⁵ GIDUSA notes that “Were enforcement of existing [environmental] laws to increase, or were new environmental laws to be enacted, Durango could incur additional compliance costs, which could be material.” (GIDUSA 2000, 17). COPAMEX states that “[h]istorically, Mexico’s environmental laws have not been enforced as vigorously as have environmental laws in the United States...[after NAFTA] we cannot assure you that our operations will not be subject to more strict Mexican federal or state environmental laws or more strict interpretation or enforcement of those laws in the future.” (COPAMEX 2000, 14)

Chapter 5. Environmental and Social Linkages with the Post-NAFTA Forestry Industry

I. THE “CAZICAZGO” SYSTEM AND THE “RENTISTA” MODEL

In Chihuahua, as in the rest of the country, about 80% of the forested lands is ejido property. The remaining 20% is either privately owned or held in some other form of social ownership (COSYDDHAC/TCPS 2000, 8, 15-16). The ejido system of land tenure has favored forest exploitation through a rigid social control structure known as “*cazicazgo*”.²⁶ The *cazicazgo* system (in the Sierra) was at least temporarily weakened when wood production decreased during the 1993-1994 period (see Chapter 4). The structure was also weakened by the collapse of socio-political control that, until 1993, had been exercised by the Liga de Comunidades Agrarias del la Confederación Nacional Campesina (CNC), an arm of the Partido Revolucionario Institucional (PRI).²⁷

Since Mexico’s entry into NAFTA, the *cazicazgo* system has adapted to the increase in forestry activity taking place, but now it has to adopt the policy of a chameleon—that is to say it has to maintain relationships with whichever political party is in power.

Cazicazgo forms the basis of the network of power relationships among actors linked to forest activity and forest policy. The key actors are both within and external to the ejido. Within the ejido, power is usually concentrated in one or two families that exercise it through the control of the ejido governing structures (*comisariado ejidal* or the *consejo de vigilancia*) and/or in those who transport the harvested wood (the transport is run as a private business, whether it involves ejidatarios or not). Outside the ejido, the *cazicazgo* network is established among the ejido administrator (who is generally external), the providers of technical forestry services, the contract representative for the companies buying the wood and, in some cases, the government authorities with responsibilities for the forestry sector.

Even though there is an institutional ejido organization required by Mexico’s Agrarian Law, the control of contracts between companies and the ejido generally occurs through the *cazicazgo* structure described above. For example, the contracts for wood are generally approved in the ejido assemblies, but these assemblies are often controlled by the *caciques*, frequently in spite of the majority opinion. This is the case because, as we have described in other work (COSYDDHAC/TCPS 2000), the ejido system is superimposed on the traditional indigenous system. In most forestry ejidos, the indigenous residents have not taken advantage of the institutional procedures established for the ejido system. Instead, that system has been used by the few who profit most from harvesting of the natural resources.

Historically, the *cazicazgo* control of the wood production and the administration of forest resources has eliminated attempts to organize and communally administer processes that would guarantee more sustainable resource management and improve social welfare. The factors through which *cazicazgo* reproduces itself and maintains its dominance over the production and commercialization of the forest

²⁶ *Cazicazgo* is very entrenched in the Sierra Tarahumara, and the peasant population, and especially indigenous people, are subject to its control. Generally, the powerful “*caciques*” who control the system are mestizos. The *cazicazgo* system is manipulated to obtain contracts for wood that primarily benefit these powerful leaders and the companies buying wood. In some cases, the system has also been used to garner votes for political parties, especially the Partido Institucional Revolucionario (PRI) (COSYDDHAC/TCPS 2000, 18-20).

²⁷ In the Sierra Madre de Chihuahua the *cazicazgo* structure was historically reinforced by the PRI, through the Confederación Nacional Campesina (CNC). The PRI has had a strong relationship with the CNC and the CNC played an important role as an intermediary in development of contracts for wood harvesting, while at the same time controlling the election process in the region. The change in state leadership from the PRI to the Partido Acción Nacional (PAN) in 1994 was also a blow to the traditional *cazicazgo* system in the Sierra Tarahumara.

resources include: lack of information on the part of indigenous people; coercion; providing alcohol; bribes; the economic debts the ejido owes to commercial enterprises; and alliances with political and economic powers.

In essence, *cazicazgo* in the Sierra is dominant, authoritarian and racist. This power structure supports a “*rentista*” model of forestry production that is predominant in the forestry ejidos of the Sierra Tarahumara.²⁸ The characteristics of the *rentista* model of forest exploitation include: (1) the wood is contracted for in logs (raw wood); (2) the company contracting for the wood conducts the production cost studies; (3) the company transfers the supervisory functions to the *comisariado ejidal* (which is generally controlled by the *caciques*); (4) the company sets the contract price; (5) the company administers the payments; (6) the company gives the responsibility for transport of the wood to private enterprises; (7) the ejido is essentially paid a “salary” for these activities, but it is not paid for the value of the wood, nor does it profit from the wood itself; (8) the ejido organizes the harvesting of the wood and the documentation; and (9) the ejido remains a decapitalized enterprise.

II. LINKAGES BETWEEN FORESTRY ACTIVITY AND SOCIAL CONFLICTS

A. Social Conflicts in Forestry Ejidos

There have been several social movements in the Sierra Tarahumara involving forestry disputes. Some of the most representative include those in Chinatú (1993); Cusarare (1994); Ocóvichi (1997) and Montede (1998), all of which are ejidos with considerable forestry resources.²⁹ The roots of the conflicts in these cases were poor ejido administration and corruption, which were reflected in over-exploitation of wood and failure of the majority of the *ejidatarios* to see any profits. To understand these movements, it is important to understand the *cazicazgo* structure (described above) as well as the payments that are made to the ejido for forest harvesting. To understand the latter, we ask: How much employment does the forestry activity generate in an ejido? What are the production costs? What does forestry work represent for peasants?

On average, forest harvesting activities generate employment for only about 10% of ejido members, leaving 90% without employment. In theory, however, 100% of the *ejidatarios* have the right to the forest because it is communal property. All members of the ejido should receive the benefits from forestry activity or direct use of the forest resources.

On the other hand, production costs, especially those for transport and technical services, are generally high. These costs are calculated based on the volume of wood for which the purchasing company contracts.

Table 5.1 Distribution of Production Costs for Typical Forestry Ejido

Activity	Percent of Total Costs
Transport of wood	60 %
Cutting, cleaning, moving, loading	20
Technical forestry services and other services ³⁰	7

²⁸ The *rentista* model is essentially based on the companies paying small salaries for supervision and cutting and transport of the wood. The ejidos do not get a fair return for the value of their forest resources, nor enough to cultivate and preserve the forest for future harvests.

²⁹ Some of these movements are described in COSYDDHAC/TCPS 2000, 41-42.

³⁰ Payments for other services include payments to Producers Associations, which form part of the structure of the new (1998) *Fideicomiso Chihuahua Forestal*. The ejidos contribute to the Producer Assns. Fees for administration of *guias forestales*, fire-fighting services and for support of the *Fideicomiso* operation. The operating capital of the *Fideicomiso* is also supported by contributions from private forest companies, and the fees are set per cubic meter of wood. According to the *Fideicomiso*'s

Administration ³¹	5
Other costs	2
Direct Profit	6

It can be seen from Table 5.1 that the amount of “profit” realized (6%) is ridiculously low, especially in comparison to the value of the resource and even in comparison to the amounts paid to the ejido authorities. Clearly, the majority of the ejidatarios—who own the resource in common—are not benefiting from this system of production.

An example of how this plays out in practice is provided by the Ejido Rocoroyvo, which has a population of about 380. The ejido occupies about 45,000 hectares and should support an annual harvest of about 18,500 cubic meters of wood. The following account from a forestry technician working in the ejido illustrates the problems:³²

In this ejido, like others in the Tarahumara lowlands, the ejidatarios are in charge of forestry activity—from the countryside until the product they are selling is delivered to the buyer. The ejidatarios, with the organization, are in charge of looking for all the means to carry out these activities. But, as a result, they are left with a minimum amount of earnings for a resource that belongs to the ejido, that is to say all the ejidatarios.

Before, the participation of the ejidatarios was small since they didn't know about forestry activities, they were badly organized and they didn't have control over the development [of the forestry resource]. Now, they want to organize their own business in order to have more control over the development [of the forestry resource], to empower their directors and the [ejido] assembly, to have direct administration, to better inform the [ejido] assembly [and] to obtain fair prices for the wood.

The ejido bought a sawmill en May of this year (2000) with an advance given by the company [that buys the wood]. The ejido sold to a private concern 300,000 [board] feet of wood that they are going to process in the ejido's mill in return for the installation of the mill. For the ejidatarios, its very important to sell sawn wood; however, the state of the industry is too premature since the conditions [necessary] to operate the sawmill in a way that guarantees its efficiency and control of production do not exist; they don't have the working capital and they have not adopted a system of measurement since the current system is in doyle feet. There are few ejidatarios that have any experience with these matters, and they have not begun the [necessary] training.

In the best of cases, the ejidatarios, as owners of the forest resources, are getting about 1000 pesos/year/ejidatario (about \$ 8.90/month) (COSYDDHAC/TCPS 2000, 13). However, day-by-day, the ejidatarios observe the intensive cutting and the increased scarcity of useful forest plants; decreasing humidity; the delay of rains that affect harvesting of their corn, bean and vegetable crops and the continued deterioration of the forest.

proposed budget, the ejidos that participate should receive payments for investing in forest cultivation. At this point, the amounts paid for this purpose, their investment and the effects on the forest have not been evaluated. The Fideicomiso is a very interesting alternative; however, there have been conflicts between the ejidos and the producer associations due to the high costs of the fees (about 15 pesos per cubic meter, compared to about 11 pesos per cubic meter paid by the timber companies) and the fact that the associations act as intermediaries in doing what the ejidos could do for themselves.

³¹ Includes the administrator, paymaster, documentation, foreman and ejido authorities.

³² Recorded in the files of Consultoría Técnica Comunitaria, A.C. June 2000.

B. Illegal Cutting

During the time that the forests of the Sierra were thick, the harvesting of wood was done without any controls—the forest was treated as something without limit, as a renewable resource. But the forests of the Sierra were severely diminished during the 20th century. One researcher (Lammertink 1997) found only 19 old-growth pine and oak stands. These old-growth forests occupy a total area of 571 square kilometers, estimated to be only 0.61% of the original 93,560 km² of original pine/oak forest in the Sierra Madre Occidental. Much of the Tarahumara forest has been cut severely, up to five times in cycles of 15 years, leaving the forest impoverished.

The 1992 forestry law’s elimination of the controls that existed on production and transportation of wood and the lifting of restrictions on the installation of sawmills and other wood processing facilities promoted more intensive illegal cutting (PROFEPA 1998, 2). Because of these trends, in 1997 the government took a step back from its deregulatory efforts and reinstated the requirements for *guías forestales* (documentation) for the shipment, transportation and storage of wood. It was not until February 2000, however, that the state of Chihuahua implemented this legislative mandate.³³

Between 1996 and 1999, 411 complaints (*denuncias populares*) involving forestry matters were presented to PROFEPA.³⁴ This statistic reflects the level of participation by peasants and indigenous peoples from forestry ejidos through the use of citizen complaints against illegal cutting of pine and oak. Also, between 1998 and 1999, COSYDDHAC and Fuerza Ambiental, A.C.³⁵ (non-governmental organizations in Chihuahua) assisted in the preparation and follow-up of 43 judicial actions against illegal cutting. These actions were filed with PROFEPA on behalf of 20 indigenous and mestizo communities of the Sierra Tarahumara (Table 5.2).

Table 5.2. Judicial Actions Filed with PROFEPA Regarding Illegal Cutting (1998-99, with assistance from COSYDDHAC and Fuerza Ambiental, A.C.)

Denuncia popular	Denuncia penal (criminal complaint)	Appeal (recurso de revisión)	Request for Information	TOTAL
31	7	3	2	43

With respect to these actions, as of March 2000, none had been resolved, even though the administrative time limits for resolution had expired. Due to the failure of PROFEPA to respond to these complaints, the communities and the non-governmental organizations providing assistance to them decided to begin a campaign “Against Impunity and For Environmental Justice in the Sierra Tarahumara.”³⁶ This campaign’s goal is to force SEMARNAP, and specifically PROFEPA, to resolve the administrative

³³ This was done only after significant pressure and was apparently done more with an eye towards improving the environmental image of the state government than of strong law enforcement. PROFEPA noted in 1998 that Chihuahua had failed to comply with its obligations under an agreement with the federal government to increase state and local enforcement of forestry laws (PROFEPA 1998). Chihuahua was the only state with which the federal government signed such agreement that failed to meet its obligations.

³⁴ Oficio:DG/003/RN/0105/2000. Expediente: 911/119/08.

³⁵ Formerly the Centro de Derecho Ambiental del Noreste de Mexico, a public interest legal defense fund.

³⁶ This campaign is supported by various local organizations, including the Diocese of the Tarahumara, COSYDDHAC, Fuerza Ambiental, the Sierra Madre Institute and people involved in the Inter-Institutional Program for Indigenous Support. At the national level in Mexico it is supported by the Red Nacional Todos Los Derechos para Todos (a human rights network) and others. At the North American level, it is supported by the Texas Center for Policy Studies, the Rural Coalition and the Comité pour la Justice Social of Canada, among others.

complaints lodged by the indigenous and mestizo communities. The campaign is centered on three demands of the responsible authorities:

- Conduct audits of the Forest Management Plans to ensure that they are in compliance with environmental regulations;
- Prepare an overall land use regulation for the Sierra, identifying areas that should be off-limits to tree harvesting and identifying areas that should be protected for flora and fauna or as biological corridors; and
- Provide civil society organizations with sufficient information supporting these analyses.

In addition, the groups have presented an Article 14 compliant to the Commission for Environmental Cooperation regarding PROFEPA's failure to effectively enforce the relevant environmental laws involved in these cases.

Table 5.3 summarizes the basis for the complaints about illegal logging. In general, the complaints involve violations of Mexico's federal environmental law, including the procedures requiring response to and resolution of citizen complaints; violations of Convention 169 of the International Labor Organization (referring to the rights of indigenous peoples); and violations of Mexico's federal penal code (Procedimientos Penales).

Table 5.3 Summary of Bases for Pending Complaints About Illegal Cutting in the Sierra Tarahumara

Legal Basis included in Complaint	Number of Cases³⁷
Failure to properly apply or comply with Arts. 189, 190, 191 of Mexico's federal environmental law, relating to the admission of, standing to file or other aspects of the citizen complaint (<i>denuncia popular</i>)	18
Failure to properly comply with Art. 176 and/or Art. 199 of the federal environmental law, regarding appeals and final resolution of complaints	12
Failure to properly comply with Art. 169 of the federal environmental law, requiring referral to the Ministerio Público	2
Failure to comply with Art. 159 of the federal environmental law regarding responses to citizen requests for information	7
Failure to properly comply with various aspects of Arts. 190-193 of the federal environmental law regarding processing of, response to and final resolution of citizen complaints	5
Failure to comply with Art. 202 of the federal environmental law, regarding requirements upon identifying violations during an inspection	15
Failure to effectively apply Art. 15.2 of	10

³⁷ Cases may involve one or more of the legal basis cited.

Convention 169 of the International Labor Organization regarding authorizations for forestry development in indigenous lands	
Violations of various provisions of Mexico's federal penal code	37

The four principle violations alleged in these complaints are: (1) failure of the Ministerio Público to participate in cases where there are probable environmental crimes; (2) denial of environmental justice to Tarahumara and Tepehuan indigenous communities; (3) failure to issue penalty orders even when violations have been documented through inspections; and (4) denial of information requested by citizens. The groups filing these complaints believe that these violations show a pattern of the inability or unwillingness of the responsible authorities to enforce the relevant laws. The causes of this failure are multiple and include lack of personnel and budget (see Chapter 6); bureaucratic inertia; and undue influence of the private sector.

C. Results of the Campaign

The campaign Against Impunity and For Environmental Justice in the Sierra Tarahumara was initiated at the September 1999 assembly of the Rural Coalition, which was held in Creel, Chihuahua.³⁸ One of the resolutions from this assembly was to present to SEMARNAP Director M. Julia Carabias a written petition emphasizing three important points:

1. The need to establish an effective process for resolving the 1998-1999 citizen complaints about illegal cutting;
2. The need to conduct an audit of the forest harvesting permits and associated forest management plans approved during 1998-1999 with the goal of determining whether these operations are in compliance with the permit and plan terms and the applicable environmental regulations, with the results of these audits being available to non-governmental organizations and citizens; and
3. Evaluate, in a scientific manner, the environmental impact of the forestry industry on the Tarahumara ecosystems, with the objective of a more rational plan for future forestry operations in the area and a land use plan to determine: forestry development areas; areas off-limits to forestry; protected areas for flora and fauna; conservation areas for old-growth forests; and biodiversity corridors.

A detailed report on the effects of forestry development in the Sierra Tarahumara was prepared by COSYDDHAC and the Texas Center for Policy Studies (COSYDDHAC/TCPS 2000). This report was released at the Montreal Colloquium for Environmental and Human Rights in March 2000 and later in March and April in various public and press fora in Mexico.

On May 23, 2000, the PROFEPA's Forestry Enforcement Division convened a first follow-up meeting regarding the legal actions that had been filed by peasants and indigenous leaders. Since that first meeting there have been four follow-up meetings that have also been attended by representatives of the Chihuahua delegation of PROFEPA and SEMARNAP; a representative of the Chihuahua State Advisory Commission on Forests and Soils; a representative of the Chihuahua state government; NGOs involved in supporting the citizen complaints; and ejido and indigenous representatives that have filed the complaints.

³⁸ The Rural Coalition is a trinational association of agricultural producers and workers, based in Washington, D.C.

Representatives of the Ecology Committee of the Chihuahuan Congress and the Confederación Nacional Campesina have also periodically attended the meetings.

In addition, COSYDDHAC has been invited to participate in the Chihuahua State Advisory Commission on Forests and Soils. The Diocese of the Tarahumara has worked with the Inter-Institutional Program for the Support of Indigenous People to establish a working group to discuss forestry-related problems of the Sierra's indigenous populations.

The campaign and these related activities have resulted in PROFEPA giving more priority to the issues. This progress is due not only to the public mobilization of the campaign and to the hundreds of campesinos and indigenous leaders behind each citizen complaint, but also to the national and international support for the campaign. As of September 2000, 23 of 29 cases have been concluded, at least with respect to the administrative process. Fines totaling over 1 million pesos (approximately \$100,000 U.S.) have been assessed, though this does not correspond to the real economic value of the pines that have been cut illegally. Collection of the fines, however, is a responsibility of municipal authorities and, to date, none have been paid.

On the other hand, there remain several omissions in the application of the penalty process, especially with regard to: (1) lack of impartiality in inspections; (2) in three cases (Cuiteco, El Consuleo and Rocoroyvo) the complainants themselves were fined; (3) claims of criminal violations have not received the necessary attention from the Office of the Public Ministry; (4) time limits for responses set out in the law have not been met; and (5) several of the final responses to the complaints do not identify the parties responsible for the violations or, in some cases, do not state clearly what violations were found or what the ultimate resolution of the complaint was. In the three cases where the complainants themselves were fined, it seems to be potentially a way of discouraging future complaints. Also, the Rocoroyvo ejido was fined for a forest fire, though such fines have not been issued to other ejidos where fires have occurred.

III. CONCLUSIONS

1. The cazicazgo structure has helped to foster an increase in forestry activity in the Sierra since Mexico's entry into NAFTA, with a new image of "productive work" for the Sierra and with a capacity to adapt to political changes in the state and the country;
2. Forestry activity under the "rentista" model that reigns in the Sierra Madre has de-capitalized the ejidos, provoked greater poverty and further degraded the natural resources, all in exchange for very small payments to the ejidos.
3. Since NAFTA, the application of environmental laws in Mexico has acquired an importance that it did not have before. However, PROFEPA has not functioned the way many citizens have hoped it would and economic powers have even more autonomy. In some instances, this problem can be attributed to lack of sufficient personnel and resources. In other cases, however, it appears that the "inefficiencies" are more intentional, because the complicity among the authorities, caciques, intermediaries and the timber companies is real.
4. Based on the experience with the citizen complaints about forestry in the Sierra Tarahumara, there is a need for legislative reform of the federal environmental law. These reforms should be directed toward establishing a more autonomous enforcement structure that has greater management capacity; that is, an enforcement process that better integrates the results of the inspection; ensures that the level of fines imposed is commensurate with the severity and economic value of the violations; and ensures that penalties assessed are, in fact, collected. Currently, the citizen complaint process does not have much

credibility for those who have used tried to use it and, in many of the cases familiar to COSYDDHAC, the penalties are subject to negotiation, and may even be paid by revenues from cutting more pine.

5. The Sierra Tarahumara presents an extremely complicated situation, considering the cazicazgo system, the lack of the rule of law with respect to forestry operations and the difficulties with the citizen complaint and penalty processes, all of which lead to a certain level of impunity for unsustainable forestry operations. There need to be new measures developed to ensure sustainable development principles are implemented for the forestry and forestry products industries; for consumers who want to know if they are purchasing wood and wood products that are produced in a sustainable manner; and especially for the sustainability of the indigenous communities that make their home under the pines of the Sierra Tarahumara and that are now, after a long period of silence, raising their voice with the law in their hands. These new measures and reforms are extremely important, because no one will be well served if the forests of the Sierra Tarahumara disappear.

Chapter 6. Indicators of Environmental Impact of Post-NAFTA Changes in Chihuahua's Forestry Industry

This chapter briefly examines available information regarding the post-NAFTA environmental impact of forestry in Chihuahua, particularly in the Sierra Tarahumara. One problem we face is the lack of sufficient environmental baseline data to which post-NAFTA conditions can be compared. Studies by the World Bank and others in the late 1980s and early 1990s indicated that the forests and the environment of the Sierra were already suffering from over-logging and poor forestry management (Lowerre 1994).³⁹ Comprehensive studies of the Sierra Tarahumara forests are generally lacking (COSYDDHAC/TCPS 2000, 21-26).

A second problem we encountered is that there have not been any comprehensive studies—and few site-specific ones—on the environmental effects of logging in the Sierra Tarahumara since 1994.⁴⁰ Given these serious limitations, we are constrained to making some general observations about the known and potential environmental effects of the forestry industry in the Sierra Tarahumara. The data we present in Chapter 4 shows, however, that logging in the Sierra Tarahumara is on the increase since 1994 and, thus, the severity of the impacts is very likely increasing.

I. DEFORESTATION AND BIODIVERSITY

As described in Chapter 2, the Sierra Tarahumara still has a rich variety of flora and fauna and more forested land than any other state in Mexico, including some of the only remaining stands of old-growth temperate forests (see also Lammertink 1997). The diversity of flora, in particular, was an important factor in the area's nomination—as part of the Apachain/Madreaan Region—as a “megadiversity” center, one of the few in North America (Felger and Wilson 1994).

At least two research teams concluded, even before NAFTA went into effect and before the recent increases in timber cutting, that logging is likely to be the greatest threat to these forests and their biodiversity (Ceballos 1993; Felger and Wilson 1994). This certainly appears to be the case now in certain forestry ejidos that have become “hot spots” of controversy about logging practices, including illegal logging, and the need for more sustainable forestry management (COSYDDHAC/TCPS 2000, 60-64). These include the San Alonso and Churo Ejidos, in the municipality of Urique; the Cienaga de Guacayvo Ejido in the municipality of Bocoyna; and the Pino Gordo and Llano Grande Ejidos in the municipality of Guadalupe y Calvo.

Much of the logging in the Sierra is done by methods that approximate clear-cutting, removing all but a few mature trees at one time. The remaining trees are often cut after they drop their seeds for “reforestation”. Researchers have long expressed concern that this technique is very damaging to biodiversity and long-term forest health in the Sierra, particularly because of the area's highly erodible soils, arid climate and slow forest regeneration rates (Ceballos 1993; Lammertink 1997).

PROFEPA has identified two regions of the Sierra as “critical zones” for deforestation (PROFEPA 1998). These zones, which are supposed to warrant increased attention for enforcement and analysis of the causes of deforestation, are shown in Table 6.1 and Map B.

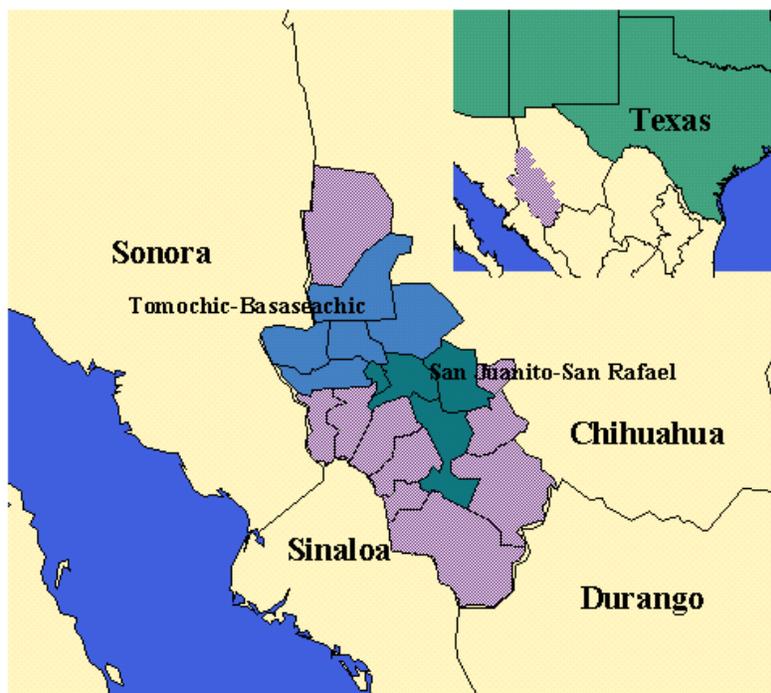
³⁹ These studies, most of which were under-funded and were based primarily on reviews of the scant existing literature, were done for a World Bank forestry loan for Chihuahua and Durango. The Bank ultimately cancelled the loan.

⁴⁰ Researchers in the Geological Sciences Department at the University of Texas in El Paso, including Dr. Robert Schmidt, are finalizing studies on land use change in the headwaters of the Conchos and other rivers that originate in the Sierra Madre, using satellite imagery technology, but the results of these studies are not yet fully available.

Table 6.1. Critical Zones Identified by PROFEPA in Chihuahua

Zone	Municipalities
Tomochic-Basaseachic (Shown in Blue)	Guerrero, Ocampo, Uruachi, Temosachi, Moris
San Juanito-San Rafael (Shown in Green)	Bocoyna, Urique, Maguarachi, Carachi

**Map B. Critical Zones of Deforestation
in the Sierra Madre of Chihuahua**



II. WATER QUALITY AND SEDIMENTATION

Apparently, there are no regular water quality monitoring stations located in the forested headwaters of the Conchos or the other rivers that flow out of the Sierra Madre (Comisión Nacional de Agua 1997). Thus, it is difficult to assess whether there have been adverse effects on these rivers from increased cutting in the forests. However, given the highly erodible soils of the Sierra and the higher rates of legal and illegal cutting, it would not be surprising if such effects were occurring.

In addition to localized stream degradation, increased erosion could result in increased sedimentation of downstream reservoirs. Mexico's National Water Commission (CNA) reports that several of the Chihuahua reservoirs downstream of the Sierra Madre are experiencing "significant" sedimentation, but the agency has not yet completed reservoir bottom elevation studies necessary to quantify the degree to which storage capacity of the reservoirs has been reduced.

There is limited information available on the discharge of pollutants from various pulp and paper plants and wood products plants in Chihuahua (Comisión Nacional de Agua 1997, 5.1.3). However, the data does not include information on instream concentrations of pollutants, the effect of these pollutants on

aquatic ecosystems or trend data over time. Thus, this information is insufficient for drawing quantifiable conclusions about the environmental effects of increased production of paper, pulp and other wood products in Chihuahua.

III. CONCLUSIONS

Much more information is necessary to determine the actual and potential effects of increased forestry production on the environment and public health in Chihuahua. The authors believe that comprehensive studies on deforestation in the Sierra Tarahumara should be undertaken immediately, building on the information gathered in the limited studies that have been conducted to date. The studies should focus on defining deforestation rates; the degree of compliance with authorized Forest Management Plans; impacts on biodiversity, soil erosion and water quality; and the effects of increased logging on the ability of area residents to engage in traditional farming and harvesting practices.

In addition, these comprehensive studies should be designed to define areas that would be off-limits to commercial harvesting (such as old growth stands with high levels of biodiversity); define sustainable harvesting rates and techniques for other forested areas; and define additional protected areas for flora and fauna.⁴¹

Additional studies on the effect of water and air pollution discharges from pulp and paper factories on the environment, especially as production has increased since NAFTA are necessary.

There is also a demonstrated need for more effective enforcement of environmental and forestry laws and more rapid response to the complaints of indigenous ejidos seeking to protect their forests from over-harvesting and illegal cutting by commercial timber interests. (See Chapter 5). The 1997 forestry law reforms provided PROFEPA with important new enforcement powers, including expanded audit authority, power to close or suspend damaging operations and power to order violators to restore ecological damage caused by their operations (PROFEPA 1998). It is likely, however, that PROFEPA will need additional resources to increase the effectiveness of its enforcement efforts, or will need to shift resources to the Sierra Tarahumara from other areas of the country.⁴²

Finally, we believe there is a critical need to promote increased knowledge of sustainable forestry management in the Sierra Tarahumara and to assist ejidos in developing markets for sustainably harvested timber.

⁴¹ In September 1999 and again in 2000, COSYDDHAC asked Mexican authorities to conduct such studies but, to date, it has not received a response.

⁴² In 1997, PROFEPA had only one inspector for each 1.19 critical area and only 1 inspector for each 208 forestry operation or facility. It had only about \$ 30,000 for monitoring of each critical area and only \$ 180 for monitoring each forestry operation (PROFEPA 1998).

Chapter 7. Overall Conclusions

The foregoing chapters demonstrate the complexity of attempting to determine how NAFTA has influenced the forestry and forest product industries in Chihuahua and how, in turn, those changes affect the environment and peoples of the Sierra Tarahumara. Any attempt to answer these questions has to consider the history of forestry operations in the area (Chapter 2), as well as the socio-political factors that determine, for all practical purposes, how forestry and enforcement of forestry and environmental regulations are carried out (Chapter 5). While export/import and other trade data demonstrate some clear post-NAFTA trends in production, these trends are significantly influenced by domestic economic conditions and prices for wood products (especially pulp and paper products) (Chapter 4). Finally, the analysis of environmental effects in this case is hampered by the lack of both pre-NAFTA and post-NAFTA comprehensive environmental studies (Chapter 6). The absence of this information makes it exceedingly difficult to quantify—either with respect to scope or location—the degree to which changes in forest harvesting and production patterns have affected the forest and other natural resources.

Despite the complexity of the analysis, however, the authors believe there are some relevant and interesting conclusions that can be drawn from the analysis provided in this report. We also have identified a number of steps that can be taken to help forest ejidos move to more sustainable forestry management and to better protect the unique biodiversity of the Sierra Tarahumara. Detailed conclusions and recommendations are presented in Chapters 3, 4, 5, 6 and 7. We highlight here those we believe are of most interest and import from the perspective of the Commission for Environmental Cooperation and the governments of Mexico and the United States.

Post-NAFTA trends in Forestry Production and Forest Products Industries

Wood production, particularly of pine, has increased substantially in Chihuahua since Mexico's entry into NAFTA, paralleling an increase in both exports of wood and wood products from Mexico and an increase of imports, particularly from the U.S. During this same period, there has been significant consolidation of the forest and forest products industries in Chihuahua and a large increase in the number of private sawmills. Forest ejidos have generally remained impoverished suppliers of raw wood, with pressure on the forests intensifying greatly over the last few years. The traditional socio-political structure that controls wood production from forestry ejidos—a structure under which a few powerful leaders profit but the majority of ejidatarios receive very little in compensation for the harvesting of wood they own in common—has persisted and adapted to changing times.

Effect of NAFTA Tariff Reductions

Based on available information, it appears that the current trends in the forestry and forestry product industries in Chihuahua are being driven as much or more by domestic economic conditions (including the value of the peso), changes in domestic forestry law and industry consolidation than by NAFTA tariff reductions. It should be noted, however, that none of these factors is necessarily unrelated to NAFTA and the generalized neoliberal and globalization policies to which NAFTA is linked.

Pre-NAFTA tariffs on wood and wood products will be progressively reduced to zero by 2003 under NAFTA, though most U.S. and Canadian tariffs were already at or near zero and most Mexican tariffs were fairly low (0 to 15% in most cases). The major forest products industries operating in Chihuahua state that reduction of Mexico's tariffs will not affect their competitive position or production levels significantly. The trade data show, however, that imports of pulp and paper products from the U.S. into Mexico have increased rapidly since NAFTA took effect. Chihuahua producers are thus under pressure to keep product prices low to maintain their competitive positions in the Mexican market. This dynamic

could put pressure on the forest products industry in Chihuahua to oppose environmental regulations that increase its cost of doing business by either making their raw wood more expensive or by imposing additional environmental controls on pulp and paper operations.

Effect of NAFTA's Provisions on Non-Tariff Barriers

NAFTA's provisions regarding non-tariff trade barriers may adversely affect the ability of Mexico to create and/or foster markets for sustainably produced wood and wood products. This is particularly true with respect to the technical standards provisions of Chapter 9 and the government procurement provisions of Chapter 10. Much depends on the interpretations of ambiguous provisions in the NAFTA text and developing WTO "jurisprudence" may influence these interpretations. While wholly voluntary certification programs for sustainably produced wood are not likely to be significantly affected by these provisions, options to use government action to promote the programs and develop markets for the wood are made less viable by NAFTA's provisions on standards.

Recent interpretations of the investment provisions of NAFTA Chapter 11, particularly the Metalclad case, pose a substantial threat to Mexico's ability to adequately regulate forestry or forestry product operations of companies from the U.S. and Canada.

Adequacy of Mexican Forestry and Environmental Laws and their Enforcement

In the last few years, indigenous leaders and others have filed hundreds of citizen complaints about illegal cutting and other unsustainable forestry practices in the Sierra Tarahumara. Our analysis indicates that there are substantial deficiencies in the adequacy and enforcement of forestry and environmental laws in Chihuahua and that response to these complaints has, on the whole, been inadequate. There are a number of reasons for this, including earlier efforts to deregulate forestry operations, intensive pressure to harvest the forest, a corrupt socio-political control structure in forestry ejidos, and lack of resources, personnel and, in some cases, political will on the part of PROFEPA.

Indigenous peoples, ejido residents, non-governmental organizations and others have now joined in a concerted campaign to help address these problems. They are asking SEMARNAP to conduct full and public audits of whether forestry operations in the Sierra Tarahumara are complying with their forestry management plans; to conduct and make public land use and ecological studies needed to identify which areas of the Sierra should be off-limits for further harvesting and to identify areas that should be protected to help sustain the Sierra's biodiversity and indigenous communities. These actions must be accompanied by swifter and more effective enforcement of existing forestry and environmental laws, at the federal, state and municipal levels.

In addition, there is an identifiable need to provide substantial technical and financial assistance to increase application of sustainable forestry techniques in the Sierra Madre and to create markets for sustainably harvested wood. Fully accomplishing these goals, however, will also require addressing the problems caused by the current corrupt ejido control structure that dominates forestry in many ejidos in the Sierra. This system, under which the ejidos have become mere suppliers of raw wood at prices well below its real value, has prevented the ejidos from breaking the cycle of poverty and natural resource degradation that is forcing many people off the land and doing great damage to the magnificent forests of the Sierra Tarahumara.

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