

The Forest Industry in the Sierra Madre of Chihuahua: Social, Economic, and Ecological Impacts



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The Forest Industry in the Sierra Madre of Chihuahua

"We want our dissatisfaction to go on the record. We also want others to know that a lot of people in the Sierra feel the same way about what we, and our forests have to put up with. We are tired of all the illegal logging financed by those who buy and transport stolen wood, and we're disgusted that has been tolerated by PROFEPA, SEMARNAP, The State Judiciary Police, and some of the Public Ministries."

A letter signed by the Commissaries of the Ciénaga de Guacayvo, Retiro, Guméachi and Los Volcanes Ejidos sent to the State Congress of Chihuahua protesting the government's inaction.

Please Note: The English version of this report differs slightly in organization and content from the Spanish version published in April, 2000. The conclusions and recommendations, however, are the same.

Barba, Graciela Baleriano, María del Rosario Córdoba and María Rosa Martínez of the Congregation Siervas de los Pobres; the Carmelite Sisters of the Sacred Heart Leobigilda Pérez Camacho, Felícitas Cruz Salas, and María de la Luz Guzmán B Sanjuana Birones M.G.E.S., Hortensia Yáñez M.G.E.S., and Luz Rodríguez of the Daughters of Charity for their dedication and thoroughness in the defense of the rights of indigenous and mestizo people.

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Executive Summary

The Sierra Tarahumara is a region of great contrasts, co-existing cultures, and overlapping economic activities, including mining, forestry, tourism, and the drug trade. The Sierra's forests are home to approximately 280,000 individuals, about 20% of whom are indigenous people with unique cultures. Of these about 92% are Tarahumara, or Rarámuri, as they refer to themselves. The region is also home to large-scale mining and forestry projects. Because of increased outside activity in the region, conflicts have resulted as indigenous groups seek to protect their cultural and social relationship to the land. The Tarahumara people now struggle to maintain their traditional way of life in the *ejido*,^{*} which is intimately related to the isolated and rugged land they occupy.

Historically, forests have been considered second-class lands in Mexico. If land is covered with forests today it is often because people found other lands less remote, less rugged, more fertile, or otherwise more suitable for farms and cities. This social neglect generally corresponds with the government's failure to study the effects lumber production has on the ecosystem and indigenous culture in the Sierra Tarahumara. Inadequate forest studies coupled with the liberalization of Mexican laws (during the 1990s), has exacerbated the problems of the region and given rise to unfettered natural resource depletion.

The Commission of Solidarity and Defense of Human Rights, A.C. and the Texas Center for Policy Studies produced this report, titled *The Forest Industry in the Sierra Madre of Chihuahua: Social, Economic, and Ecological Impacts*, in order to better evaluate the ecological, social, and economic problems forestry creates in the region. The goal of the document is to open a dialogue between those interested in economic development and those interested in balancing production, the quality of life, ecology, respect for human rights, and respect for indigenous rights in the Sierra Tarahumara. Only this will guarantee that the Sierra's natural resources will not vanish.

Mexico has had forestry legislation since 1884—most of it focused on regulating and establishing control of natural resources. However, recent legislative changes have increased the pressure to cut pine in the forests of the Sierra Tarahumara. Legislative changes to Article 27 of the Mexican Constitution, the laws regulating agrarian and forestry activities, introduced fundamental changes to land rights. Land redistribution to peasants was eliminated, transfer of ejido lands were authorized, *ejiditarios* were granted the right to sell their land, and agrarian courts were created to solve land claim conflicts. The government intended these changes to encourage outside investment in ejido lands, leading to more productive use. In reality, the reforms have drastically disturbed the traditional form of land ownership in the Sierra Tarahumara and threatened the ejido's existence.

The changes begun in 1992 continued in 1994 with reforms to the General Law on Ecological Equilibrium and Environmental Protection (LGEEPA) and Mexico's participation in NAFTA, and they culminated in 1997 with further reforms to forestry laws. These changes reflect the ongoing shift in the government's economic paradigm toward

* *Ejido*, pronounced (a-he-tho) is a form of communal ownership of the land that has its roots in pre-Colombian indigenous cultures. For several decades after the Mexican Revolution, land was redistributed and the modern ejido was formed. Much of Mexico's indigenous population lives in ejidos or communities, but without the autonomy granted to North-American indigenous peoples on the reservation. It is common for ejidos to be ethnically mixed.

liberalization, recruitment of foreign investment, and market-based mechanisms of environmental regulation.

As a result of legislative reforms and market liberalization, lumber extraction has rapidly increased in the region's forests. By 1997, only 0.61% of the original old-growth pine and oak forests remained throughout Mexico from forests that once spanned 93,560 sq. kilometers. Other factors that have given rise to forest depletion include: community *cacicazgo* power structures, corruption, illegal cutting, and the intensive felling of pine trees. The period from 1994 to 1999 also saw an exponential growth of sawmills, while the industrial base of the forest ejidos was systematically dismantled.

These changes have not gone unnoticed by the indigenous communities and poor *mestizos* living throughout the Sierra, who depend on the forest for their livelihood. From 1996 to 1999, they made use of their legal rights to file complaints to the Federal Environmental Protection Agency (PROFEPA) under the LGEEPA. According to government statistics, groups lodged 411 popular complaints related to forestry violations during that period, which amounts to 8.6 complaints per month.

This report discusses how over-cutting and illegal logging forced several ejidos to direct cases to PROFEPA, including the ejidos of San Alonso in the municipality of Urique; Ciénaga of Guacayvo in the municipality of Bocoyna; Pino Gordo and Llano Grande in the municipality of Guadalupe y Calvo. The implementation of the Copper Canyon tourism mega-project has also spawned several popular movements. Five star hotels, luxury class tourism, and their comfort requirements have created a series of ecological and social consequences for the region and its inhabitants.

The report ends with twelve conclusions, given in Chapter Eight, which are designed to guide public policy in the direction of achieving sustainability in the timber industry of Chihuahua. It is socially and ethically urgent that government and social institutions responsible for the Sierra Tarahumara forge policies that will promote true, sustainable development. Thus far, only unmanaged and sometimes corrupt expansion of forestry has occurred, leaving poverty, violence, and environmental degradation in its wake.

Notwithstanding regional differences, what is happening in the Sierra Tarahumara is the reflection of what is happening in other forests and jungles of Mexico. For this reason, the information contained in this report, and the conclusions derived from it, should provide valuable lessons for the rest of the country.

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Chapter 1

Overview of the Sierra Tarahumara

The Sierra Tarahumara, as it is commonly called, is also the Sierra Madre Occidental, the southward continuation of the Rocky Mountains that spills into the border state of Chihuahua. 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. To the east it borders Coahuila, to the west Sonora and Sinaloa, and to the south Durango. The Sierra Tarahumara contains 19 *municipios* (roughly equal to counties) with an extension comprising one fifth of Chihuahua's total territory.¹ (see **Map A**)

Because of economic pressures, the Sierra Madre's forests have been transformed into a source of raw material for industry. This is despite the fact that the forests have so many other important functions. They produce oxygen and biomass and are the source of important hydrological systems for vast regions of Mexico and the United States. They also sustain life for the indigenous people of the region, who continue to maintain their customs.

This chapter provides an overview of the forest region of the State of Chihuahua, examining its inhabitants, land ownership, geography, hydrology, biodiversity, wildlife and economy.

Map A. Municipalities of the Sierra Madre of Chihuahua (Sierra Tarahumara)



1.1 Population

The Sierra Madre's forests are home to approximately 280,000 individuals, about 20% (55,000) of whom are indigenous people with their own unique cultures.² Of these about 92% are *Tarahumara*, the largest of four indigenous groups that inhabit the region, known as the Sierra Tarahumara. The other 8% are spread among the Tepehuán, Guarojío, and Pima.³ The *Tarahumares* of the High Sierra call themselves *Rarámuri* and those from the Low Sierra refer to themselves as *Rarómari*. The *Tepehuanes* also call themselves *Ódami*; the Pimas are known as the *O'oba* and the Guarojíos consider themselves *Warijios*, *Warijóo*, or *Varijío*.⁴

The indigenous people who live in the Sierra co-exist with *mestizos* (mixed bloods). While the indigenous people live dispersed in hamlets throughout the Sierra, the mestizos tend to prefer the region's main urban centers: Guachochi, Cerocahui, Batopilas, Creel, and San Juanito, to name the best-known towns. The mestizo population in the Sierra is larger than the indigenous one.

The cultural survival of the region's indigenous people depends on their co-existence with the land, the forests, the springs, and the flora and fauna. Most indigenous people in Chihuahua own land collectively, living in farming communities known as *ejidos*. The *ejido* is a form of "social property," which had its earliest origins in meso-American cultural practices. However, social property as it exists today owes much to the Mexican Revolution of 1910 and subsequent land reforms. The Agrarian Reform of 1934, for example, returned vast areas of land to the peasants living in the Sierra and organized the land under the *ejido* structure. As a result, 39.2% of all land ownership in rural Chihuahua is

considered social property. About 17.5% of this social property lies in the Sierra Tarahumara, and much of it is forestland. Throughout Mexico, 80% of the country's forestlands are now owned as social property.

Table 1.1 Land Ownership in Mexican Forest Regions, 1996

Type	Percentage
Social Property	80%
Private Property	15%
Federal Property (Protected Areas)	5%

Source: Leticia Merino, et al., *El Manejo Forestal Comunitario en México y Sus Perspectivas de Sustentabilidad*. UNAM, México, D.F., 1997.

1.2 Geography

The Sierra Madre mountain range is 1,250 kilometers long and starts 50 km south of the U.S.-Mexico border, where it runs from the northwest to the southeast through the states of Sonora, Chihuahua, and Durango, then veering southeast through Nayarit and Jalisco.⁵ The Tarahumara ranges between 2000 and 3300 meters above sea level from north to south. The highest peaks reach altitudes from 2000 to 2800 meters in the northern and central regions. Toward the south of the state, the Tarahumara's highest peak, El Cerro del Mohinora in the municipality of Guadalupe y Calvo, rises to a height of 3300 meters.⁶

The Sierra Tarahumara contains 53,398.4 square kilometers and two well-defined topographic regions, each with its own climate, wildlife, and demographic distribution patterns.⁷ (see **Map B**) One region, the Highlands, has a rather cold climate with a yearly average of 16 degrees Centigrade. This region is 448 kilometers long and spans 192 kilometers at its widest point. It can generally be

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



described as a high plateau with narrow valleys and some deep, rugged canyons. The habitat of the Highlands is considered to be one of cool, temperate forests. The most important species of trees in the Highlands include conifers, several species of oak (*Quercus*), and many members of the *Agave* family. The principal commercial pine species of the Highland are arizónica, ayacahuite, feflexa, Chihuahuana, and ponderosa.⁸

Toward the west, the Lowlands are known for their plunging, rugged canyons and dry tropical climate. The average temperature is 40 degrees Centigrade and the average altitudes run from 500 to 1200 meters above sea level. The Lowlands are home to an important cactus population in addition to sub-tropical plants, citrus trees, and fruits that prefer a warm climate. The wildlife includes species of agave, sycamore, guamuchiles, parrots, badgers, and

limacoas.⁹ Some of the main canyons are: Copper Canyon, Urique Canyon, Batopilas Canyon, Candameña Canyon, and Sinforosa Canyon.¹⁰

1.3 Hydrology

The Sierra Tarahumara and its forests are a vital link in the hydrological chain because they capture precipitation, hold and recycle nutrients in the soil, and form stable waterways that benefit enormous river basins. Shade provided by the forests is important for regulating temperature, sustaining the rain cycle, and providing habitat for unique species of flora. The water that originates in the Sierra feeds into five major river basins. The Papigochi River flows into the Yaqui River, and the Chínipas River becomes the Mayo River, both of which are essential sources of water for Sonora's most important irrigation districts.¹¹ The

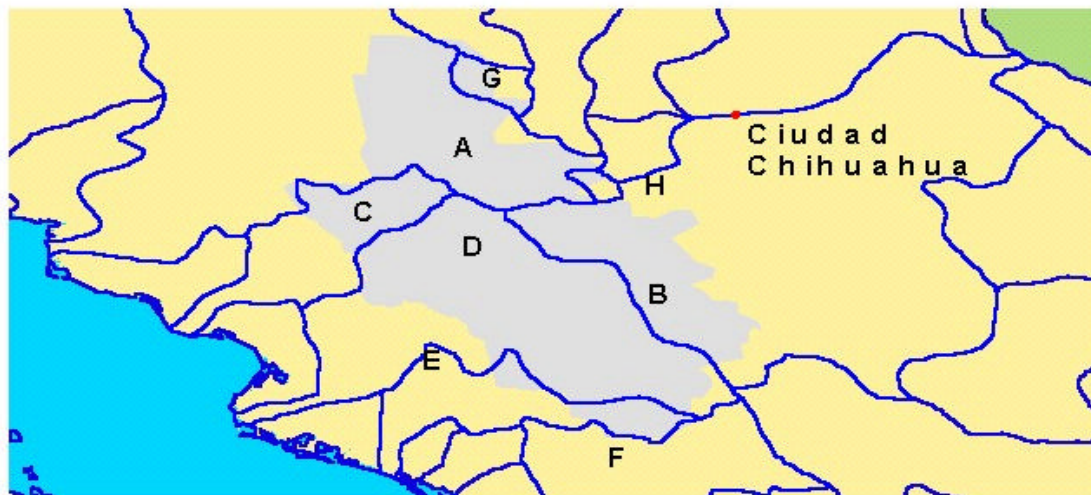
Urique River, the Batopilas River, and the Verde River all flow into the Fuerte River, where the riverbasin extends for 35 square kilometers. The Fuerte River flows into the San Blas River of the State of Sinaloa, and the San José and Basonopita Rivers in Municipality of Guadalupe y Calvo feed into the Sinaloa River. The San Blas and Sinaloa Rivers make irrigation possible in vast regions of Sinaloa before emptying into the Pacific Ocean.

The Conchos River gathers all the water of the eastern region. Its basin extends for 77,000 square kilometers and, at the City of Ojinaga on the U.S.-Mexico border, it spills into the Río Bravo or Rio Grande. In the south, the Conchos River is of great importance to the states of Texas, Chihuahua, Coahuila, Nuevo León, and Tamaulipas because it historically has contributed at least 50% of the Río Grande's water between

Presidio, Texas and Amistad Reservoir.¹² Over the past ten years, protracted drought and increased water use has lowered the volumes of the Conchos River. This has created considerable tension between the United States and Mexico and especially between farmers from Mexican border states and Texas. (See **Map C**)

The loss of forest cover in the Sierra Tarahumara as a result of current logging practices has caused erosion, which reduces the filtration of rainwater into the aquifers, finally affecting the quantity and quality of water in rivers and streams. An indication of the problems occurring in the region's hydrological system, partially resulting from drought conditions, is that Basaseachi Falls, one of America's highest waterfalls located in one of the state's few protected areas, dried up for the first time in recorded history in 1999.

Map C. Riverbasins of the Sierra Madre Occidental of Chihuahua



- | | | |
|----------------------|----------------------------|------------------------|
| A. Yaqui Riverbasin | B. Conchos River basin | C. Mayo Riverbasin |
| D. Fuerte Riverbasin | E. Sinaloa Riverbasin | F. Culiscan Riverbasin |
| G. Jaral Riverbasin | H. Laguna de los Mexicanos | |

1.4 Biodiversity

From a biological perspective, the Sierra is important for its unique biodiversity. The Western Sierra Madre region of Northern Mexico – Chihuahua and Durango – is complex, and its forests are “*the largest existing ecosystems in Southwestern North America that produce oxygen and biomass.*”¹³ Vegetation varies according to the elevation and orientation of the slopes where it is found, and includes conifer forests, pine-oak forests, deciduous forests, tropical forests, and grasslands.

George Mayer, a German geographer, cites Conservation International in a 1989 statement about the Sierra Tarahumara: “The Western Sierra Madre ecosystem combines transitions of extreme differences in altitude and climate to form the greatest biodiversity of the American continent. 7,000 plant species, or one fourth of all the botanical species in Mexico, are found in the region.”¹⁴ Other studies submit that, “there are 4,000 species of flora in comparison with the Sierra of Durango which has 3,740 species.”¹⁵ Although there is a discrepancy between these two studies, they both recognize that there are a large number of endemic species either considered extinct, near extinction, or endangered in the Sierra Madre.

Biodiversity is crucial to the traditional economy of the indigenous people who inhabit the region. The Sierra Tarahumara is home to approximately 1000 useful, wild plants. Until now, 350 edible plants and 600 medicinal plants have been documented. Robert Bye, a North American biologist, remarks that “Traditional Tarahumara medicine includes 300 plant species... Thanks to Tarahumaran agro-ecological practices, the genetic flow between cultivated plants and wild plants has been maintained,

which could account for the development of the red runner bean that adapts to high altitude and short growing seasons.”¹⁶

1.5 Wildlife

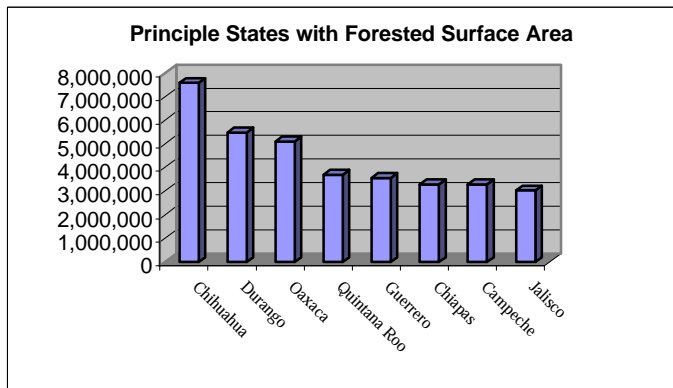
Wildlife plays an important role in the ecology of the Sierra Tarahumara. One study asserts that 219 vertebrate species have been registered including 74 mammals, 64 reptiles, 46 birds, 18 fish, and 17 amphibians.¹⁷ Others report the existence of 63 mammal, 268 bird, 87 reptile, and 20 amphibian species in the Tarahumara.¹⁸ Still others submit that there are 104 vertebrate species.¹⁹ Despite these discrepancies, the studies agree that numerous species of fauna have become extinct, and that many others are on the verge of extinction or are endangered. Extinct, endangered, or threatened species are a direct reflection on the general health of the environment.

The construction of dams, aquifer reduction, intensive logging, and the expansion of agriculture and livestock grazing have all had a profound impact on the region’s mammals. At least 29 species are either endangered or on the verge of extinction; some of the best known are the prairie dog, the beaver, the Mexican wolf, white tail deer, and several bat species.²⁰ The Tarahumaran frog, the whooping crane, the Eskimo curlew, the wolf, and the grizzly bear, have all ceased to exist in the Sierra Tarahumara.²¹ Furthermore, between 1901 and 1975, more than 41% of the region’s fish species disappeared.²²

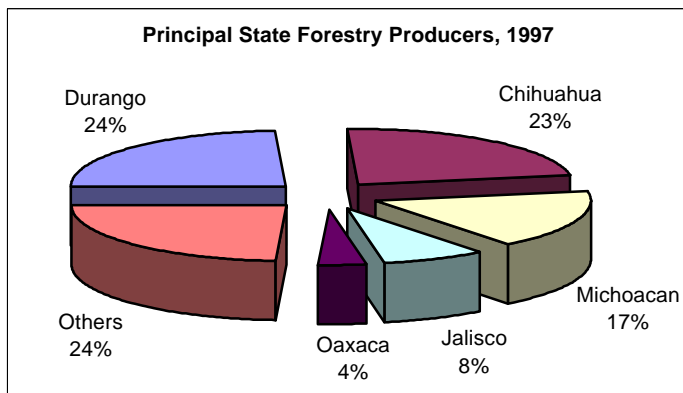
1.6 Economy

The Sierra Tarahumara has traditionally been an economic niche for the extraction of raw materials. Mining was the first industry developed in the Sierra during the 18th and 19th centuries

and continued up until the first half of the 20th century, providing Chihuahua with a substantial source of income. As mining was being developed, the forests of the Sierra provided needed raw materials, but forestry did not become a primary economic activity until later.



Source: SARH, *Inventario Nacional Forestal Periodico 1992-1994*, Mexico, D.F. 1994



Source: SEMARNAP, *Anuario Estadístico de Produccion Forestal, 1997*

In the mid-20th century, the timber industry began to gradually develop. During this century, the Tarahumaran forests became a source of raw material for U.S. industry and were used as fuel for the new steam engines. 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.²³ The logging industry

is one of its most important economic activities.

Company mergers have shaped the forest industry in the state of Chihuahua during the last 40 years. The 1990s saw a culmination of these mergers as three large companies consolidated their control of the wood products market. The three companies include the Monterrey-based consortium Corporación Papelera Mexicana (COPAMEX), Grupo Industrial de Durango (GIDUSA) and Empresas la Moderna.²⁴ These companies established vertical control over the forest industry by merging with smaller companies and by readily adapting to changes in the economy, changes in the timber market, and changes in forestry legislation.

While the forest has generated massive profits for the owners of the lumber companies, ejidos and indigenous communities have received little benefit from the forest resource. Ejidos were given jurisdiction of the forest's timber and arable lands within their property boundaries through agrarian reforms in the 1930s. Today, it is only a source of subsistence income. The farmer as an ejidatario is entitled to an annual dividend for the sale of the ejido's wood. In the best cases, however, the average annual dividend per farmer in the Sierra Tarahumara is 1,000.00 pesos, which is about 83 pesos (about 9 dollars) per month.

In order to supplement this income, some farmers go to work in the fields of Cuauhtémoc, Sinaloa, and Sonora. Still others travel to larger cities to sell folk art and medicinal plants, to work in assembly plants (*maquiladoras*), or as unskilled labor in construction. As people constantly emigrate from the Sierra Madre to the state's urban centers (Cuauhtémoc, Parral, Chihuahua, and Ciudad Juárez) they also move on to other

areas including the United States, where they seek better living conditions.

1.7 Rural Economy

Traditionally, indigenous farmers cultivate corn, beans, and some vegetables. They also have small herds of goats and, at times, cattle. After the Sierra was colonized and goats were introduced, the indigenous inhabitants incorporated shepherding into their semi-nomadic lifestyle. The inhabitants would spend the summer months in the higher regions of the Sierra, and would descend to winter in the Lowland's canyons. This practice still continues in some of the Rarámuri communities that are spread throughout the canyons.²⁵ Goats are also an important part of their diet, and are used in the *Yúmارة* ritual – a traditional ceremony for giving thanks and requesting aid – during which one or more of the goats are given as an offering and then eaten by the community.

The forest has been a source of livelihood for the indigenous people, who use it for their domestic needs: the construction of their dwellings, the gathering of edible plants and medicinal herbs, and for objects used in their daily life, like *bateas* (washbasins), drums and violins. The biologist, Robert Bye, is constantly reminding us that the forest has different kinds of value, which is why he urges greater study before clear-cutting it. One startling example cited by Bye is *Chuchupate*, one of the roots used in Rarámuri medicine. One hectare of *chuchupate* is currently worth about \$75,000 dollars while the commercial value of the wood on that very same hectare is about 5,000 dollars.²⁶

1.8 The Rise of the Drug Trade

The cultivation of marijuana and opium poppy began to spread to specific areas of the Sierra about twenty years ago. Some farmers began to cultivate marijuana and opium poppy in order to supplement their income. Now they have become major cash crops, and this has produced ominous social, economic, and political consequences for the region. Even though the cultivation of these plants is punishable by law, thousands of farmers who are disenfranchised from legal economic activities are willing to take the risk because it provides them with temporary and relatively well paid work.

The cultivation of marijuana and poppy probably has ecological impacts as well, due to the chemical substances used in its cultivation and those used to eradicate the plants. No studies have yet been conducted on this topic, despite reported increases in certain types of cancer in the areas where these crops are grown.

The official response to the cultivation and commercialization of these crops is the war on drugs. Promoted by the United States, the Mexican Government has used this campaign to militarize the Sierra Tarahumara and other parts of the Republic. This has given rise to numerous human rights violations in addition to the violation of constitutional guarantees of the inhabitants of the Sierra. There has also been a dramatic rise in drug consumption and in violence within the communities themselves.²⁷

1.9 The Panacea of Tourism

During the government of Fernando Reyes Baeza Meléndez (1986-1992) a nascent tourism industry came to fruition under the name of the Copper Canyon Tourism Project. This project began with the drive to build highways, called the *Gran Visión*, which was financed, in part, by the World Bank.

The Copper Canyon Tourism Project has been the State's grand project for the past two administrations, first with the government of Francisco Barrio Terrazas (1992-1998), and now with Patricio Martínez (1998-2004). Both governments turned to tourism as a strategic activity to promote regional development. The Copper Canyon project has received strong support from the federal government, as well as resources channeled through federal institutions, private banks, and the Inter-American Development Bank (IDB).

Tourism, however, has generated serious problems for local inhabitants because the concept of tourism promoted by public institutions and the private sector—even though eco-tourism and adventure tourism is always mentioned—is based on five-star hotels. Under this concept, tourism requires a backdrop of folklore, land, water, and picturesque landscapes, putting pressure on and causing conflict among the local inhabitants who own the land. They may well be pushed aside in favor of private investors who plan to build huge hotels with toilets that use six gallons of water with every flush in a place where this vital liquid is scarce. Despite the possible harm to the indigenous community, no environmental impact study was undertaken prior to the launch of the tourism project, nor were studies

conducted to determine how to transport water to the hotels.

1.10 Impacts on Indigenous Culture

The development of the forest industry, together with the changes in agriculture from 1920 to 1992 has had significant impacts on life in the indigenous communities. Agrarian reforms have altered communities' traditional forms of organization, ranging from small changes in the ejido structure to the subordination of traditional authorities to agrarian and government authorities. These effects have weakened the strength of the traditional authorities and the communities' internal cohesion. Tarahumara are now showing a growing interest in learning about forestry because they realize the importance of managing their resources and of running the ejido for themselves, rather than relying on caciques or governmental authorities.

In some regions, the indigenous communities openly resist the continuous logging of the forest, while in others indigenous people gradually have accepted the economic changes. Broad indigenous participation in lumber production, however, is uncommon. According to an INI study titled, *Indigenous People and Micro-development in the Sierra Tarahumara*, (1993) "Forestry is not considered to be a traditional indigenous activity, but is seen as something imposed from the outside by the *chabochis* (mestizos) that has destroyed their relationship with the ecosystems. They feel that it has further undermined their ability to control their own natural resources and helped to consolidate cacicazgos based on the control of forest resources. This has created conflict, poverty, disenfranchisement, and above all, has weakened their autonomy..."²⁸

Since the early 1990s, most recorded Rarámuri and Odami declarations focus on the negative effects forestry has on traditional society. Statements against outside intrusion such as, “*the pillage of our medicinal plants by foreigners and mestizos and illegal logging are doing away with the remedies we need to cure ourselves*”²⁹ are common. Many aspects of traditional culture including

community trials, festivals and rituals, the use of natural resources and their conservation, and the traditional family structure are all based on rotating responsibilities and the naming of traditional authorities, which are being challenged by outside authorities. The declarations in **Table 1.2** illustrate some of the Rarámuri and Odami’s complaints.

Table 1.2 Complaints Made by Indigenous Communities

Topic	Complaints and Demands
1. Environmental Sphere: Natural Resources of the Forest and Medicinal Plants	<ol style="list-style-type: none"> 1. “Indigenous control over forest management and exploitation 2. Respect for indigenous knowledge of ecological forest management 3. Indigenous authorities enforce and supervise regulations 4. Change from Doyle feet system to the decimal metric system, 5. Support reforestation 6. Appropriate technical forestry services to indigenous people.”
2. Land Ownership, Security of Land Ownership	<ol style="list-style-type: none"> 1. “Suspension of forestry in areas where land ownership is under dispute 2. Clear definition of ejido boundaries 3. Training 4. Cancel the selling of ejido lands.”
3. Political Sphere: Tarahumara Representation vis a vis Mestizo Society	“We do not recognize the new Supreme Council that was recently formed (...) they are bilingual teachers who were not named by us.”
4. Culture	“We are against people and firms that come into our communities without our permission and attempt to do away with our customs like the fiesta, the <i>nawesari</i> and <i>el teswino</i> .”*

* Note: *Nawésari*: the words of the *siríame*, which is the way the community speaks of its problems and receives guidance and advice. *Teswino*: traditional drink made of fermented corn used extensively in the Rarámuri and Odami cultures.

Source: Huchaboochi, and INI, *Indigenous People and Micro-Development*, 1993, 50-53.

The statements gathered in council meetings promoted by the INI in 1992 and 1993 focus on four major problem, including: (1) use of their natural resources; (2) land ownership and the protection of indigenous land; (3) political representation *vis a vis* mestizo society; and (4) respect for their culture and customs. To date, nothing has been done to resolve these problems.

1.11 Conclusion and Report Organization

The Sierra Tarahumara is a region of great contrasts, co-existing cultures, and overlapping economic activities including mining, forestry, tourism, and the drug trade. The complaints made by the Sierra’s indigenous communities in **Table 1.2** are often the result of these overlapping economic activities. The indigenous people of the region share a

different vision of natural resource management from the mestizos and government authorities. Indigenous people are directly affected by the way natural resources are managed and for them, “*the Earth and all that exists in her*”³⁰ is the source of life. Mestizos, on the other hand, view the forest as a source of wealth and raw material. The words of a Tarahumar from the Highlands nicely sum up what is often at the heart of many conflicts between the two groups: “*A Rarámuri has a different relationship with a tree than a mestizo does. You can’t sell what belongs to Mother Earth and Father God.*”³¹ To better address these conflicts, we have organized information in this report into eight chapters which examine the complaints of the Sierra’s indigenous communities as well as the social, economic, and ecological impacts of forestry on the Sierra Tarahumara.

The second chapter, for instance, examines the ecological condition of the Sierra Tarahumara. It presents characteristics of the Sierra’s forests and emphasizes the biodiversity of its flora and fauna, and examines a series of environmental studies that were carried out by World Bank and the Mexican Government from 1989 to 1993. This chapter contemplates the impacts the forest industry has had on the region’s indigenous cultures, paying special attention to the transition to a market economy, and the impact the timber industry has had on the ecology of the Sierra Tarahumara.

The third chapter analyzes the effect on land ownership in Chihuahua brought about by changes made to Article 27 of the Constitution and the Certification Program of Ejidal Rights and Titling of Urban Dwellings (PROCEDE).

Chapter Four examines political changes that have affected the forest

sector in Mexico throughout the 20th century. The chapter begins with the rise of the timber industry in Chihuahua during the 19th century and then considers how historical relationships between legislative change, forestry methods, production schemes, and market coverage have influenced the timber industry in the Sierra. The chapter ends with a discussion of the modifications of the Forestry Law in 1992 and 1997 that dramatically liberalized the government’s limited control of the forest industry in order to attract foreign capital. The liberalization of Mexican laws, meant to encourage and protect investment in the region, has also given rise to increased natural resource extraction and has had a profound effect on the lives of indigenous people living in the Sierra.

Chapter Five deals with forestry production models and their attributes. It presents a picture of timber production in Chihuahua and portrays the general tendencies of the forest industry, placing special emphasis on the re-structuring of capital in companies dedicated to transformational activities.

Chapter Six focuses on the most relevant social movements in forest ejidos of the Sierra Tarahumara and the factors that have given rise to them, including the *cacicazgo*, corruption, illegal cutting, and the intensive logging of pine trees. This chapter features the complaints for over-cutting and illegal logging lodged by the ejidos of San Alonso, municipality of Urique; Ciénaga of Guacayvo, municipality of Bocoyna; and Pino Gordo and Llano Grande, municipality of Guadalupe y Calvo.

The implementation of the Copper Canyon tourism mega-project spawned several popular movements, the most important of which are covered in Chapter Seven. In the context of a region where the main economic activity has

been the forest, a new activity is gradually taking its place: luxury class tourism. Five star hotels and their comfort requirements also have a series of ecological and social consequences.

The report ends with twelve conclusions, given in Chapter Eight, which are designed to guide public policy in the direction of achieving sustainability in the timber industry of Chihuahua. Addressing the current economic and ecological emergency can no longer be postponed, and it is socially and ethically urgent that this matter be resolved. To date, the social institutions responsible for the Sierra Tarahumara have been incapable of forging policies that will promote true, sustainable development.

Notwithstanding regional differences, what is happening in the Sierra Tarahumara is the reflection of what is happening in other forests and jungles of Mexico. Though they are a renewable resource, several species of pine are beginning to vanish in extensive regions of the Tarahumara because of changes in government management practices. For this reason, the information contained in this report, and the conclusions derived from it, are both urgent and of importance for the rest of the country. The report also demonstrates the need for an environmental evaluation that will allow indigenous communities to determine which areas of the Sierra require environmental protection and which areas are suitable for sustainable forestry.

¹ *Chihuahua: Panorama Agropecuario: VII Censo Agropecuario*, Instituto Nacional de Estadística Geográfica e Informática, INEGI, 1991

² INEGI, *XI Censo General de Población y Viviendo*, 1990, and Instituto Nacional Indigenista (INI) *Subdirección de Investigación*, 1993.

³ Comisión Nacional de Derechos Humanos, *Informe sobre el Programa de Atención a Comunidades Indígenas de la Sierra Tarahumara* (México, D.F.: Comisión Nacional de Derechos Humanos, 1993) 15 – 18

⁴ Special edition: “Iniciativa de Ley Reglamentaria de los Derechos de los Pueblos Indígenas del Estado de Chihuahua”, Kwira, Marzo, 1998

⁵ Mayer, George. *Informe para la Secretaría de Relaciones Exteriores de los Estados Unidos Mexicanos: Sobre los conflictos sociales, económicos, ecológicos e interétnicos en la Sierra Tarahumara*. Chihuahua, 1996.

⁶ Mayer, Op. Cit.

⁷ Campbell W. Pennington, *The Tarahumar of Mexico: Their Environment and Material Cultures*, Guadalajara, Jalisco, Mexico, 1997 and Comisión Nacional de Derechos Humanos, *Informe sobre el Programa de Atención a Comunidades Indígenas de la Sierra Tarahumara* (Comisión Nacional de Derechos Humanos, 1993), 15

⁸ Pennington, 34-35.

⁹ Luis González, Susana Gutiérrez, Paola Stefani, Margarita Urías, Augusto Urteaga, *Derechos Culturales y Derechos Indígenas en la Sierra Tarahumara* (Ciudad Juárez, Universidad Autónoma de Ciudad Juárez, 1994), 17.

¹⁰ Comisión Nacional de Derechos Humanos, *Informe*, 15.

¹¹ Mayer, Op. Cit.

¹² S. Miyamoto, L. B. Fenn, and D. Swietlik, *Flow, Salts, and Trace Elements in the Rio Grande: A Review*, Texas A&M University System, Texas Water Resources Institute, MP 1764, July, 1995, Table 4, p. 5.

¹³ DeBano et al, *Biodiversity and Management of the Madrean Archipelago. The Sky Islands of Southwestern United States and Northwestern Mexico*. USDA Forest Service, General Technical Report RM-GTR-264. Tucson, AZ. July 1995 and Felger, Richard y Wilson, Michael F., *Northern Sierra Madre Occidental and Its Apachian Outliers: A Neglected Center of Biodiversity*, 48.

¹⁴ Conservation International, *Mexico's Living Endowment: An Overview for Biological Diversity*. In Mayer, Op. Cit.

- ¹⁵ Centro de Ecología de la UNAM, *Evaluación y recuperación de especies amenazadas y en peligro de extinción en Chihuahua y Durango 1993*. (Survey and Rescue of Threatened and Endangered Species in Chihuahua and Durango, 1993) Final report.
- ¹⁶ Felger and Wilson, Op. Cit. p. 40
- ¹⁷ Mayer, Op. Cit.
- ¹⁸ UNAM, Op. Cit.
- ¹⁹ Felger and Wilson, Op. Cit, 41.
- ²⁰ Felger y Wilson, Op. Cit, 41.
- ²¹ List, Rurik and Moctezuma, Oscar "Cooperative Conservation: Ongoing efforts in the Sierra Madre," 1999.
- ²² Contreras, S., V. Landa, T. Villegas, and G. Rodríguez, *Fish, Fish-farming, Dams, Pollution, Fish Planning and Monitoring in Mexico*. MEM Symposium on Fishing and Continental Water, 1976, pp. 315-346. The situation of one of the Sierra's endemic species, the Aparique Trout, which has not been adequately studied, is of great concern. According to preliminary research, habitat sites along the Sinaloa and Culiacán River basins have been severely degraded due, in part, to forestry activities. Furthermore, in the higher parts of the Fuerte River basin, some restaurants have been damming up some tributaries in order to harvest Rainbow Trout. This has effects on the natural flow of the streams and river and could cause the domination of the native species (Aparique) by the exotic species (Rainbow). The Bosque Modelo Program also promotes the cultivation of Rainbow Trout with the idea of improving the income of local inhabitants without considering that this may have a negative impact on a species that is more important for the region. According to Felger and Wilson, Op. Cit., the destruction of river basins that occurred in the United States, is being repeated in Mexico: the construction of dams, and the channeling and of streams and rivers for irrigation fragments fish populations. The exotic species have mated with related species, thus creating new, hybrid species. Now it is very difficult to find genetically pure species.
- ²³ SEMARNAP, *Anuario Estadístico de Producción Forestal 1997*, (Annual Forest Production Statistics), 19.
- ²⁴ El Grupo Chihuahua was the most important economic group. It controlled all of the forestry activities that went on in the state. It also had ties with the Monterrey Group and the Guadiana y Rincón Group from the State of Durango. In addition to directing the financial, real estate and insurance activities of Multibanco Comermex S.A., Hoteles Palmar and Seguros la Comercial S.A., in the forestry sector it owned the following companies: Bosques de Chihuahua S.A., Celulosa de Chihuahua S.A., Industrias de Madera S.A., Páneos Ponderosa S.A., Plywood Ponderosa S.A., Ponderosa de Chihuahua S.A., Provedora Industrial de Chihuahua S.A., Provedora Industrial S.A., Provedora Industrial Forestal S.A., y Papeleras Ponderosa S.A. In: Enríquez, Jorge, *Análisis geo-económico del sistema regional de la Sierra Tarahumara*, UNAM, México, 1988, 173.
- ²⁵ Under normal circumstances, agriculture provides food for them nine months out of the year, and their livestock allows them to deal with unforeseen emergencies because they can sell off individual animals.
- ²⁶ Felger & Wilson, 1995 Op. Cit, 23.
- ²⁷ *Informes Anuales*, Comisión de Solidaridad y Defensa de los Derechos Humanos A.C. (COSYDDHAC Annual Reports) Chihuahua, 1989-1998.
- ²⁸ Instituto Nacional Indigenista (INI), *Pueblos Indígenas y Microdesarrollo en la Tarahumara*, Programa de Desarrollo Forestal Chihuahua-Durango. Delegación Chihuahua. *Seminario Permanente sobre Indigenismo*, Chihuahua, December 7 and 8, 1993, 71.
- ²⁹ INI, *Pueblos Indígenas*, Op. Cit, 52.
- ³⁰ The expression "the Earth and all that exists in her" is the Indigenous way of referring to the right to the land and its natural resources. *Consulta Sobre los Cambios al Artículo 27 Constitucional*, COSYDDHAC, November, 1992
- ³¹ "Bosque sobre ruedas en la Tarahumara" (A Forest on Wheels in the Tarahumara)," *La Jornada*, 8 de Julio de 1996.

2.1 Forest Studies: the Lack of Knowledge

There is little doubt that human activities in the Sierra Tarahumara have impacted the ecology of the region. Overgrazing by cattle is transforming natural ecosystems and allowing invasion by non-native plant species. Logging has resulted in habitat loss and fragmentation of the forest cover. Studies estimate that throughout Mexico only 0.6%—571 square kilometers—of original old-growth pine-oak forest remain. As we emphasized in the previous chapter, more than 41% of fish species vanished in 14 localities of Chihuahua between 1901 and 1975. Also missing from the region are the wolf, grizzly bear, elk, bighorn sheep, and bison, and locals report that traditional medicinal plants have become scarce.

Some universities and conservationist organizations have performed studies regarding the environmental condition of the Sierra Tarahumara, and governmental institutions have executed environmental impact statements regarding certain aspects of the Sierra. Unfortunately, these studies have never been organized into a data-base that would allow citizens, government officials, and private investors to access the information necessary for planning long-term policies designed to balance production needs with the protection of the environment and indigenous culture.

Furthermore, no overall environmental analysis—including an examination of the impacts of logging, road construction, and tourism—has been

conducted, other than the inadequate environmental studies resulting from a defunct World Bank project in the early 1990s. For the governmental sector, environmental studies have been perceived as a requirement instead of a useful instrument for long-term policy planning. Even rates of deforestation in the Sierra Tarahumara have not been properly documented.

The current lack of knowledge of the effects of the forest industry on the Sierra Tarahumara demonstrates the urgent need for an environmental evaluation that will support the redefinition of the forest industry's future in the region.

2.2 One Ecological Study: The World Bank Forestry Project (1989-1993)

Very few forestry studies in Chihuahua have been used to design policies oriented toward the adequate management, conservation, and restoration of the Sierra Tarahumara's forests. However, between 1989 and 1993, the World Bank financed the Mexican Forestry Development Project in the two northern forest-rich states of Chihuahua and Durango. The Bank's loan provided financing for a number of studies and reports to be completed both prior to and during the disbursement of the loan. The studies were to examine possible economic and ecological effects of the Bank's loan on the Sierra. Among these reports, the most comprehensive ecological study of the region was conducted by Dr. G. Ceballos of the Universidad Nacional Autonoma de Mexico (UNAM), titled *Evaluation and*

Recovery of Threatened and Endangered Species in Chihuahua and Durango.

Dr. Ceballos' study examines the flora and fauna of the Sierra Tarahumara to determine priority areas for conservation. The study identifies grasslands, conifers, oak, pine-oak and tropical deciduous forests as the principal types of vegetation in the Sierra. Overall, the flora of Chihuahua consists of almost 4,000 species and the flora of Durango consists of 3,740 species. Habitats are critical in the Sierra because of the uniqueness, high endemism, and richness of flora species in the region. Several plant species are known to be edible and are used by the local population. About 350 species of plants are medicinal, 193 are edible, 75 are used for forage, and 75 are cultivated for ornamentals. These species derive from 12 genera including *Agave*, *Capsicum*, *Cucurbita*, *Hyptis*, *Jarilla*, *Panicum*, *Phaseolus*, *Plantago*, *Prunus*, *Quercus*, *Salvia*, and *Solanum*. In the field, scientists working with Dr. Ceballos visited pine forests and pine-oak forests. There, they observed 43 species of mammals including beaver, mountain lion, and white-tailed deer and 136 species of birds including the Peregrine falcon, the green macaw, and the thick-billed parakeet. Overall, 484 vertebrate species live in the region. At least 17 species of mammals are endangered, 4 of which are endemic to Mexico. 341 species of birds also live in Chihuahua, of which 21 species are endangered.

Some populations of plant and animal species have suffered depletion as the result of loss of habitat in the Sierra. Reptiles and amphibians are especially susceptible to the loss of habitat and at least 22 species of reptiles and 12 species of amphibians are endemic to the area. The report identifies possible threats to the region's habitats as the result of population pressure, agricultural

practices, excessive grazing, road construction, and logging for timber and pulp. It then emphasizes that forest clearings have had the greatest impact on the ecosystems in the Sierra Madre.³²

Based on these observations, the study presents general criteria for logging and conservation efforts in the Sierra Tarahumara. In terms of logging, the report calls for selective logging in the Sierra, which will assure the conservation of biodiversity as well as the structural characteristics of the forests. The report specifies what species can be logged, how many trees should be left standing in an acre, how the structural diversity of the forest should be maintained, and which agricultural and ranching practices are productive for the area. These guidelines fall into 39 categories of do's and don'ts. For example, the report suggests logging oaks with heavily branched trunks first, leaving five to ten trees standing per hectare, respecting the technical norms of SEMARNAP, and allowing for an interval of 150 years between cuttings to replace old growth.

In terms of conservation, the study recommends protecting five types of areas in the Sierra including (1) areas for priority animal species, (2) areas for priority plant species, (3) areas critical for bioconservation, (4) areas of forest protection, and (5) areas protected by law. To each of these areas, the study assigns general criteria for forest planning. For example, the study recommends forest protection in 44 areas of Chihuahua based on the presence of natural trees, virgin forests, and priority plant species. In these areas, the study recommends no logging and controlled collection of seeds. **Table 2.1** presents other areas designated for conservation in the report.

Table 2.1 Priority Areas for Conservation in the Sierra Tarahumara

	Chihuahua	Durango
Areas for priority animal species	18	15
Eg. <i>Aguila chrysaetos</i>	1	10
<i>Rhynchopsitta pachyrhynca</i>	10	4
<i>Strix occidentalis</i>	7	1
Areas for priority plant species	42	20
Areas critical for bioconservation	26 areas total	
Areas of forest protection	44	30
Areas protected by law	8	4

Source: Dr. G. Ceballos, Chapter 8, "Priority Areas for Conservation," *Evaluation and Recovery of Threatened and Endangered Species in Chihuahua and Durango*, UNAM, 1993, pp. 178-270.

Given the inadequate resources and time available for the study, Dr. Ceballos' team did a remarkable job. Nevertheless, while Dr. Ceballos' report presents a useful discussion of the natural resources of Chihuahua and Durango (including climate, soil, animal and plant resources, timber resources, fuel wood resources, agricultural and grazing resources), it generally fails to account for the effects of forestry on these resources. The report could have been strengthened by providing more information on the type of trees that are presently logged commercially in Chihuahua and Durango, the current rates of deforestation in the Sierra, and its effects on rural communities, especially the Tarahumara. The report also does not address land use and land tenure in the Sierra. **Table 2.2** presents other gaps in Dr. Ceballos' study.

As a result of these gaps, the study does not provide a sufficient basis to evaluate the impacts of major forestry projects on the ecosystems of Chihuahua and Durango. Specifically, the lack of information prevents (a) making reliable decisions about which areas to protect, (b) designing methods to mitigate adverse effects of timber harvesting or road building, or (c) establishing a valid

monitoring plan to monitor the impacts of timber harvesting and road building.

As part of the World Bank Forestry Project, scientists were also required to conduct a series of environmental baseline studies (EBS) and environmental impact studies (EIS). These studies were prerequisites to the disbursement of funds under the World Bank loan and were mandated by the Mexican Forestry Law of 1992.³³ Generally, they required applicants to describe the physical and biological characteristics of the forest, the activities planned, the environmental impacts expected, the methods used to minimize impacts, and the plan for reforestation.³⁴

Environmental baseline studies were designed to identify the World Bank's principal operating areas in the Sierra Madre of Durango and Chihuahua. The Bank's operations were mainly limited to opening roads, providing loans to forest producers, providing institutional support to the government, or allowing for specialized research. As part of these projects, environmental baseline studies were used to designate old-growth areas and other forest areas in need of protection and to identify areas for logging.

Table 2.2 Gaps in the Ecological Study for the World Bank Loan

<i>Gaps:</i>	<i>Comments received by the Texas Center for Policy Studies</i>
	The report identifies species and locations, but it does not address the potential impacts of logging on the areas or species;
	Aquatic habitats and species are mostly ignored in spite of the fact that highly erodible soils could result in significant adverse impacts;
	There are indications that the majority of the information on species was predicted from data on climate, topography and soils rather than based on field work;
	Most, if not all, of the sampling for the studies was apparently done along the accessible vehicle roads;
	The report recommends protection of many “postage stamp-sized” plots that are much too small to be viable for species protection; and
	Many of the areas proposed for protection are on private property not covered by the loan.

Source: Comments provided to the Texas Center for Policy Studies by independent experts and released in Rick Lowerre, *Update to the Evaluation of the Forestry Development Project of the World Bank in Sierra Madre Occidental in Chihuahua and Durango, Mexico*, May 1994.

More specifically the studies identified (a) potentially sensitive ecological areas in need of protection, (b) groupings of specific types of trees, (c) particular soil types (information used to measure and control erosion), (d) species in danger of extinction (e) areas inhabited by humans and their economic activities, and (f) areas in urgent need of reforestation.

The Texas Center for Policy Studies found nine environmental impact studies performed by the FAO (1988), the World Bank (1988), the Autonomous University of Chihuahua (1991, 1990-1991, and 1992), the Center for Scientific and Technological Research of the University of Sonora (1990), and the National Autonomous University of Mexico (1991 and 1993).³⁵

Implementation of the Bank loan was hampered by the failure to conduct an adequate social assessment of the region, which prevented the participation of local communities and international non-governmental organizations in the project. Because of these problems and because the lives of indigenous people were being disrupted (no jobs were promised to local inhabitants), many environmental organizations opposed the

loan.³⁶ In response, the World Bank placed 95 percent of the original \$45.5 million loan on hold by July 1991. In 1993, the Bank and the Mexican government officially closed the “Forestry Development Project” due to the failure to meet its development objectives. In subsequent analysis, the Bank and Mexican government determined that the Mexico Forestry Development project failed because of a lack of environmental and social guidelines, inadequate social assessment and stakeholder participation, insufficient budgetary allocation, and a change in administration.³⁷

Afterwards, the Bank and Mexican government recognized the need for creating a forest strategy based on the broad environmental, social and economic values associated with the Sierra Tarahumara. The Mexican government also recognized the importance of forestry as a potential avenue of poverty alleviation for marginalized ejidos and forest communities.³⁸

Unfortunately, the suspension of the World Bank loan did little to solve the main problems in the Sierra Tarahumara: the need for a sound environmental assessment that will allow for sustainable lumber production and a healthy balance between lumber production, the ecosystem, and indigenous culture. As the Texas Center for Policy Studies mentioned in its second analysis of the World Bank Forestry Loan Project (1994), *“Although the project has been cancelled, the environmental threats continue because lumber is still produced without an effective protection and conservation program. Road rehabilitation has stimulated large-scale foreign investment in logging. Furthermore, all of the risks associated with the initial Bank plans for “even aged management,” such as the possible erosion of fragile soils and the loss of biodiversity, still exist.”*³⁹

2.3 Other Ecological Studies

While other studies have examined the ecological effects of forestry across diverse areas of Mexico, very few have examined the ecology of the Sierra Tarahumara in detail. For example, the national average deforestation rate varies from 370 thousand hectares to 1.5 million hectares per year. INEGI reports in the *Inventario Nacional Forestal Periodico* that deforestation for the decade from 1980 to 1990 averaged 370 thousand hectares per year. Agricultural land increased 39 percent between 1970 and 1990, while the area of forestry was reduced by 13 percent. In total, the area identified as degraded forest increased 17.8 million hectares in the last 10 years.⁴⁰ Furthermore, some scientists have observed that the natural regeneration rate lags well behind the destruction of forests due to fire.

The deforestation rate for the Sierra Tarahumara is very difficult to ascertain. Studies estimated the forest cover in Sierra once spanned a surface of 6 million hectares. Now scientists estimate that 4 million hectares (9,884,000 acres) of forest remain in the region.⁴¹ For example, S. R. Felger and Michael Wilson estimate that only 2% of the old conifer forests remain in the central region of the Sierra Tarahumara. Another study found 19 old-growth pine-oak forest sites present in the Sierra. The total area of these forests comes to 571 square kilometers, which represents 0.61% of the Sierra’s original 93,560 square kilometers of pine-oak forests.⁴² Scientists attribute deforestation in the Sierra to several factors including population growth, livestock expansion, slash and burn agriculture, the construction of dams, mining, and the drug trade (clearing of forest and use of herbicides).⁴³ Felger and Wilson conclude that the greatest threat to the Sierra’s forests are the lumber industry and the paper industry.

Despite these deforestation rates, reforestation initiatives have been modest in Chihuahua. According to SEMARNAP, some 3 million plants and trees have been “restored” through protection, restoration, agriculture, silviculture, and rural and community plantations in Chihuahua. These efforts reportedly restored 4500 hectares of forest.⁴⁴ However, as deforestation rates reach tens of thousands of hectares, the quantity and quality of reforestation fails to match the extraction rate of lumber. Part of the difficulty in achieving reforestation results from the climate and ecology of the Sierra Madre of Chihuahua and Durango. According to Dr. Ceballos’ study *“extensive logging in pine forests is not applied in Southwestern United States because reforestation is difficult. Although the Western Sierra Madre has*

different flora characteristics, it is adapted to climatic patterns similar to those of Southwestern United States. An area that has been extensively logged in this part of the United States cannot be reforested, even when attempts are made to plant the trees."⁴⁵

As deforestation rates continue to rise in the Sierra Tarahumara, the methods used to produce lumber and paper become important. Currently, most logging enterprises use the *regular forestry method* to extract wood from the Sierra. The regular forestry method is a type of clear cutting where all but a few mature trees are cut one at a time. The trees that are left are then cut after they drop seeds for reforestation. Unfortunately, the application of the regular forest method has not been studied enough in the region, and it is possible that it does not lead to balanced reforestation in many areas. Given the potential impacts related to erosion, the difficulty in forest regeneration, and the importance of biodiversity, this is a high-risk method.⁴⁶

In practice, the regular forestry method makes it harder for the forest to recover from extensive logging projects. One study affirms, "*In Southern Mexico, pulp forests can be managed on a 12 year cycle, though they often run for 18 to 20 years. In Northern Mexico, and specifically in Chihuahua, rotations should happen every 80 to 100 years depending on site factors.*"⁴⁷ The rotation cycles in the Sierra Tarahumara currently run for 15 or 20 years. Logging the forest in this manner, especially when it is extensive, causes habitat loss and the fragmentation of the forest, and will soon "*degrade [the Sierra's forests] into poor secondary forests.*"⁴⁸ In fact, J.M. Lammertink declares that "*When the area has been cut just one time, the selective logging of pines of diameters larger than*

30 cm, as practiced in the Sierra, along with the removal of most dead trees used for cellulose, will leave behind a varied forest comprised of madrones, mature oak, and, at times, non-commercial conifers like firs. The most impoverished forests are those that have been logged several times. These secondary growth areas become monotonous pine forests filled with saplings of the same age."⁴⁹

It follows that wildlife also suffers from loss of habitat and degraded forests. Three bird species endemic to the pine-oak forests of the Sierra's mountains are now extinct, including the Imperial Woodpecker (*Campephilus imperialus*).⁵⁰ The Western Mountain Parrot (*Rhyncopistta pachyrhyncha*) and the Trogon (*Euptilotis neoxenus*) are in danger of extinction. There is one initiative in the Cebadillas Ejido to protect the reproductive sites of the Mountain Parrot, which involves ejido members, several U.S. and Mexican NGOs, and two universities.⁵¹

Overall, the lack of reliable information on the ecology of the Sierra Tarahumara makes it difficult to draw conclusions about the effects of forestry on the region. Scattered evidence suggests that over-harvesting is having negative effects on the flora and fauna of the Sierra. Yet, in order to examine these ecological effects and to address the complaints and demands made by indigenous people—i.e. for government authorities to respect indigenous knowledge of ecological forest management; to allow indigenous authorities to enforce and supervise regulations; to support reforestation; and to appropriate technical forestry services to indigenous people⁵²—we will need a better understanding of the Sierra's ecosystem and how regular forestry methods are affecting it.

³² Dr. G. Ceballos, Chapter 6, "Forest Management and Wild Fauna," *Evaluation and Recovery of Threatened and Endangered Species in Chihuahua and Durango Final Report* (Evaluación y recuperación de especies amenazadas y en peligro de extinción en Chihuahua y Durango. Informe Final), Centro de Ecología, UNAM, 1993, pp. 154-171.

³³ Nacional Financiera, *Seminario sobre el Programa de Desarrollo Forestal de Durango y Chihuahua*, August 1989. The World Bank-SARH Forestry Development Project for Durango and Chihuahua rose to over \$90 million, \$45.5 million of which would be covered by the World Bank, and the rest by the Mexican Government.

³⁴ Environmental Law Institute, *Legal Aspects of Forest Management in Mexico*, 1998, pp. 63-64.

³⁵ World Bank, *Mexico Community Forestry Project: Staff Appraisal Report*, 1997, p. 11.

³⁶ Dr. James Lee, "Mexican Deforestation in the Sierra Madre," Trade and Environment Database, American University, 30 April 1996. The NGOs most active in opposition to the Bank loan were Native Seeds/SEARCH and Arizona Rainforest Alliance in Arizona, the Texas Center for Policy Studies, and COSYDDHAC, La Comisión de Solidaridad y Defensa de los Derechos Humanos, A.C.

³⁷ CONAF, "Lessons Learned from Previous Bank Involvement," available www.semarnap.gob.mx/ssrn/conaf/leccion.htm

³⁸ In December of 1996, Mexico received a \$35 million loan from the World Bank. The criticism of the previous project encouraged the World Bank to change the focus of the newer loan and of other loans in developing nations. In contrast to the former project in the Sierra Tarahumara, the new project was designed to promote sustainable forest resource management in ejidos and communities in the State of Oaxaca, Mexico.

³⁹ Richard Lowerre, *Evaluation of the World Bank Forestry Project in the Sierra Madre Occidental of Chihuahua and Durango*, Texas Center for Policy Studies, May 1994, p. 2

⁴⁰ SEMARNAP, "El Sector Forestal de Mexico: Situación Actual y Perspectivas 1999," 2.

⁴¹ DeBano et al. Op. Cit., James T. Fisher, Patrick A. Glass, & John T. Harrington, *Temperate Pines of Northern Mexico: Their Use, Abuse, and Regeneration*. p 169

⁴² J.M. Lammertink, J.A. Rojas Tomé, F.M. Casillas Orona and R.L. Otto, *Bosques Antiguos de Pino-Encino de la Sierra Madre Occidental y Sus Aves Endémicas*, (Condition and Conservation of the Old Growth Pine-Oak Forests of the Sierra Madre and its Endemic Birds) Consejo Internacional para la Preservación de Las Aves, Mexico, 1997 p.17.

⁴³ S.R. Felger and Michael Wilson, *Northern Sierra Madre Occidental and Its Apachian Outliers: A Neglected Center of Biodiversity*, p. 46. In some parts of the Sierra, indigenous people use slash and burn techniques before turning the soil. The system works on a rotation basis and, after a while, they abandon the field so that it can recover. After it rests, they will use it again.

⁴⁴ SEMARNAP, "Programa Nacional de Reforestación," *Anuario Estadístico de la Producción Forestal*, pp. 97- 98.

⁴⁵ Dr. Ceballos, Op Cit. p. 22

⁴⁶ Richard Lowerre, *Evaluation of the World Bank Forestry Project*, p.5.

⁴⁷ Fisher et al., p. 166

⁴⁸ J.M. Lammertink et al, p. 20.

⁴⁹ J.M. Lammertink et al, p. 20

⁵⁰ J.M. Lammertink et al, pp. 37-50

⁵¹ These include: Dr. Ernesto Enkerlin del Instituto Tecnológico de Monterrey; Pronatura Noreste, A.C. ; The Wild Lands Project. Tucson, AZ; and the Sierra Madre Alliance.

⁵² See **Table 1.2 Complaints Made by Indigenous Communities**, Huchaboochi and INI, *Indigenous People and Micro-Development*, 1993, pp. 50-53.

Chapter 3

Land Ownership: The Key to Reorganizing the Forest Industry

Land ownership is key to understanding the political and economic pressures on the indigenous populations living in Mexico. Nearly 50% of all land in Mexico is “social property,” collectively owned by farming communities known as *ejidos*. Amendments to the Mexican Constitution in 1992 introduced fundamental changes in the nature of property ownership, allowing for the sale of communally owned land. These changes threatened the traditional structures of the community and ejido and later became a rallying point for indigenous people. In council meetings promoted by the INI in 1992 and 1993, Tarahumaran indigenous leaders identified security of land ownership as a major problem confronting indigenous society. In response, they called for (1) suspension of forestry in areas where land ownership is under dispute; (2) clear definition of ejido boundaries; (3) training; and (4) canceling the sale of ejido lands.

This chapter analyzes the effect on land ownership in Chihuahua brought about by changes made to Article 27 of the Constitution and the inception of the Certification Program of Ejidal Rights and Titling of Urban Dwellings (PROCEDE).

3.1 Land Ownership under the Ejido Structure

Most indigenous people live in ejidos or communal groups on rural lands held in common and managed with some level of government control. Ejidos and

communities account for 39.2% of all land ownership in Chihuahua. 17.5% of this social property lies in the Sierra Tarahumara, and much of it is forested land. **Table 3.1** breaks down the forms of land ownership in the state of Chihuahua.

Ejidos with large portions of forest are called forest ejidos. They presently account for more than 90% of timber production for the Chihuahuan forest industry. In 1997, for example, of the 720 forest management permits granted in Chihuahua, 680 were allotted in the 19 municipalities of the Sierra Tarahumara. Much of the wood produced in the state comes from five Sierra municipalities: Guachochi, Madera, Balleza, Bocoyna, and Guadalupe y Calvo.⁵³ With the exception of Madera, each of these municipalities has a significant population of indigenous people. (see **Table 3.2 and Map D**)

Unfortunately, there is no uniform ejido structure to manage forest resources in the Sierra Tarahumara. Instead, there are several forms of local governance, each allowing indigenous people different decision-making powers in forestry activities. The administrative structure for the ejidos was originally outlined in the Agrarian Code and after a few alterations this structure remains in effect today. Typically, governing authority is vested in the General Assembly of Ejidatarios, comprised of all members of the ejido.⁵⁴ The General Assembly makes all decisions regarding natural resources and land use for the ejidos, according to general ejido statutes. The day-to-day administrative and management functions

of the ejido are performed by the ‘Ejido Commissary’ composed of three elected officials serving three-year terms—a president, treasurer, and secretary. The Ejido Commissary, who by law represents the ejido members, guarantees that forest contracts are executed and, therefore, that wood is supplied to the

companies. These officials must be ejiditarios and are normally recognized leaders within the community. They are, however, neither trained nor well versed in either natural resource management or general administration.

Table 3.1 Land Ownership in the State of Chihuahua

Type of land ownership	Agrarian Centers	Number of members	Number of plots	Surface in Hectares*	Percentage
Ejidal	887	116,991		9,223,779	36.9
Communal	72	4,997		578,676	2.3
Colonia	55		6,252	1,132,949	4.5
Private			15,954	12,208,946	48.8
Federal Lands			1,088	665,795	2.6
Total	1,004	121,988	24,277	24,998,643	100

* One hectare is equal to 2.471 acres. The State of Chihuahua has a total surface of 24,992,474 hectares, 67 municipalities, and 2,792,989 inhabitants.

Source: *Registro Agrario Nacional. Dirección General de Catastro Rural*, August 1998.

Through Article 27 of the Mexican Constitution, ejidos were given jurisdiction of the forest resource and arable lands within their property boundaries.⁵⁵ This privilege does not include other natural resources such as water, wildlife, fish, minerals, etc. but it allows ejidos control over the timber resource with some oversight by the federal government via laws and regulations.

To assist the ejidos with forest management, the federal government created ‘Forest Conservation and Development Units’ or UCODEFOs to function as technical advisors. In coordination with the former Ministry of Agriculture and Water Resources (SARH), the UCODEFOs acted as quasi-governmental offices in charge of preparing forest management plans and ensuring that ejidos harvested timber in accordance with federal law and regulation. These Units were primarily composed of professional foresters and

associations of forest technicians paid by the ejido, but under the authority of the federal government. Thus, the UCODEFOs operated as separate departments or consulting agencies within the ejido. As might be imagined, this arrangement drew much criticism from the ejido assemblies, which felt the UCODEFOs placed an undue burden on their finances and political sovereignty.⁵⁶

The introduction of UCODEFOs into the political organization of the ejidos also had negative consequences for their system of local governance. Where indigenous communities’ control over the natural resource was not secure, the forestry technicians of the UCODEFOs were able to exploit the lack of organization of the ejidos and the lack of knowledge of forest industry to their advantage. In this manner, a network of power relationships commonly known as the *cacicazgo* emerged in the Sierra Tarahumara. Firmly rooted in local governance, the *cacicazgo* is an

institution that exercises social and economic control over the Sierra's poor farmers and indigenous inhabitants. *Cacicazgos* are usually in the hands of presidents of ejido commissaries, forest

engineers, consultants, or lumber contractors that intervene in lumber contracting through the highly inflexible regulatory process.

Table 3.2 Economic Indicators of Forest Production in the Sierra Madre

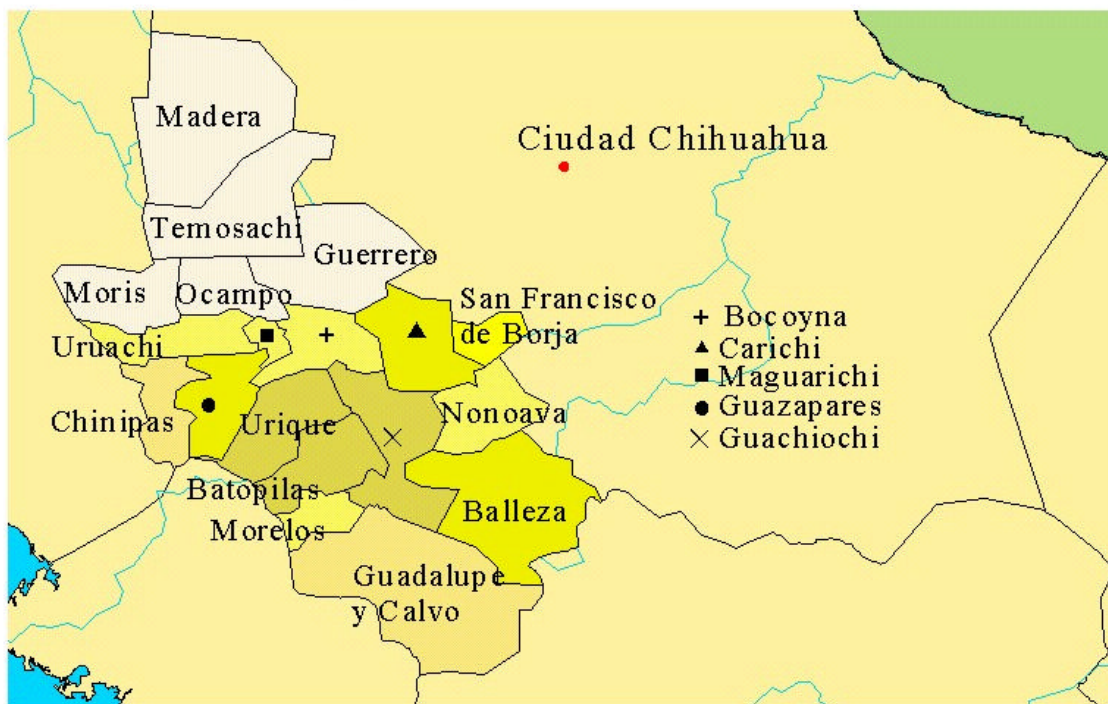
Name of Municipality	Total Population, 1990	Raramuri Population, 1990	Percentage of Total	Forestry Permits, 1997	Wood Authorized (trunk cubic meters), 1997
Balleza	14,757	5,306	36%	25	147,354
Batopilas	9,751	4,293	44%	11	27,856
Bocoyna	22,417	4,329	19%	56	173,337
Carichí	9,527	3,735	39%	3	5,220
Chínipas	7,116	557	8%	2	12,631
Guachochi	34,255	19,537	57%	285	273,905
Guadalupe y Calvo	34,955	4,086	12%	101	411,600
Guazapares	10,082	3,379	34%	8	48,319
Guerrero	41,564	534	1%	39	110,571
Madera	35,837	54	0.15%	35	578,815
Maguarichi	1,690	337	20%	11	14,860
Morelos	6,547	1,587	24%	27	61,422
Moris	4,965	101	2%	8	55,493
Nonoava	3,516	624	18%	0	0
Ocampo	7,211	49	1%	29	166,843
San Francisco de Borja	3,220	185	6%	0	0
Temósachi	9,021	59	1%	15	212,499
Urique	15,848	6,848	43%	21	56,005
Uruachi	7,314	1,304	18%	4	19,757
Total, Sierra Madre	279,593	56,904	20%	680	2,376,487
TOTAL, Chihuahua	1,916,014	60,348	3%	726	2,453,439

Source for Column 1, 2 and 3: Comisión Nacional de Derechos Humanos, *Informe sobre el programa de atención a comunidades indígenas de la Sierra Tarahumara* (MEXICO, 1993), 16; Source for Column 3 and 4: SEMARNAP, *Anuario Estadístico de Producción Forestal*, 1997.

The cacicazgo structure serves to control the rural population and ensure that lumber and natural resource contracts will benefit buyers. According to an INI study titled, *Indigenous People and Micro-development in the Sierra Tarahumara*, (1993) "Forestry is not considered to be a traditional indigenous activity, but is seen as something imposed from the outside by the *chabochis* (mestizos) that has destroyed their

relationship with the ecosystems. They feel that it has further undermined their ability to control their own natural resources and helped to consolidate cacicazgos based on the control of forest resources. This has created conflict, poverty, disenfranchisement, and above all, has weakened their autonomy..."⁵⁷

**Map D. Percentage of Population that is Raramuri and Volume of Wood Authorized by Permit, 1997
(thousands of cubic meters)**



Municipality	Population	Percentage of Population that is Raramuri
Madera	579	0-2%
Guadalupe y Calvo	412	2-12%
Guachiochi	274	39-57%
Temosachi	213	0-2%
Bocoyna	173	12-24%
Ocampo	167	0-2%
Balleza	147	24-39%
Guerrero	111	0-2%
Morelos	61	12-24%
Moris	55	0-2%
Guazapares	48	24-39%

3.2 The Reform of Constitutional Article 27

The evolution of the present-day ejido system began in the early 1900s with the Mexican Revolution (1910-1915). The Revolution was basically an agrarian revolution to address the injustices of land distribution and to create land reform. It resulted in the system of land reform laid out in Article 27 of the Mexican Constitution of 1917.

Among many property reforms, Article 27 allowed for the creation of ejidos from hacienda land expropriated from foreign owners. It also placed limits on the size of individual landholdings and prohibited large landholdings (*latifundios*), allowing individuals to hold no more than 100 hectares of land for most agricultural purposes. Corporations were limited to holding lands up to 25 times the individual limit.⁵⁸ For the indigenous populations living in the ejidos and rural communities of northern Mexico, Article

27 of the Constitution fostered significant land reform and it became an emblem of the peasants' struggle for land.

Indigenous populations now view limits on property ownership as essential regulations to protect the ejido structure and their communal way of life. However, in November of 1992, President Carlos Salinas de Gortari introduced a series of fundamental reforms of Mexico's Constitution, including Article 27, dramatically altering the traditional, social ownership of land. The modifications to Article 27 removed many of the legal protections for ejido land, allowing it to be rented or sold to individuals or to foreign or domestic corporations. Individual ejidatarios can now sell their private forest holdings to whomever they chose; they can also offer their land rights as collateral for loans.⁵⁹ Private companies can obtain up to 20,000 hectares of non-agricultural land for forest management or forest plantations.⁶⁰ With these changes, the doors were opened for private investment in ejidos and communities throughout rural Mexico. By establishing renting, leasing, and investing partnerships in the ejidos the government intended to modernize, attract investment, and prepare the country for economic integration through NAFTA.

Indigenous groups living in the Sierra Madre viewed these changes in land ownership with some trepidation. Many believed the 1992 reforms of Article 27 were designed to pave the way for the privatization of social property in order to use ejido lands commercially. They saw the reforms as a challenge to their traditional way of life. They also believed that the reforms would promote the cacicazgo because many of the region's indigenous communities do not understand the reforms of Article 27. In the case of the Tarahumara, Huichol, and

Tepehuano peoples dispersed through northern Chihuahua, mestizo ejido leaders generally took advantage of the lack of interest of indigenous groups in forestry commercialization and took the bulk of profits from this activity.⁶¹

3.3 Challenges to Ejido Land Ownership under PROCEDE

Within the new legal framework established by the 1992 reforms of Article 27 and the Agrarian Law, the Mexican government created a certification program of ejido rights and titling of urban dwellings, known as PROCEDE. PROCEDE was designed to regulate ejido and community lands. Through PROCEDE, ejidos can obtain *pleno dominio* over the land once the certification process for common use lands, plots, and agrarian are finished. They can then sell it, rent it, or otherwise lose it, which means that the ejido can cease to exist as a social structure. When PROCEDE began in 1993, farmers from the ejidos of Chinéachi, Bacaburiachi, Wacaréachi, and Bakeachi in the municipality of Carichí complained to the Commission of Solidarity and Defense of Human Rights, A.C. (COSYDDHAC) that they lacked sufficient information about the program. This made it impossible for them to come to any decision regarding the program. Farmers from Tajírachi ejido in the same municipality complained that PROCEDE promoted the titling of twenty-hectare plots, thus legalizing the hoarding of land by two families.

Because of these complaints, COSYDDHAC introduced an initiative before the State Advisory Board for Agrarian Affairs and the Agrarian Attorney General's office to stop the surveying of agricultural plots in forest ejidos of Chihuahua. By April of 1999, 33

of the 1004 ejidos of the state of Chihuahua had requested *pleno dominio*. (see **Table 3.3**) These ejidos were in the municipalities of Madera, Guerrero, Chínipas, and Guazap, in areas outside the Sierra where the population is predominantly mestizo. Only 4 were allowed to dissolve the ejido.⁶² Three of those that received permission to dissolve have already been swallowed by Ciudad Juárez and one is in the municipality of San Buenaventura. The remaining 30 ejidos were denied permission because they had not completed PROCEDE's requirements, or because there were enough farmers opposed to the measure in the ejido assembly to stop the dissolution.

Thus far, there are no real cases of the consolidation of ejido lands or sale of small forest properties in Chihuahua as a

result of the amendment of Article 27. Instead, land reforms have had greater impact on the southeastern part of Mexico, where commercial plantations financed by Simpson, Kraft, SAVIA and International Paper Company have begun to operate.

It thus appears that the Article 27 reforms have not yet had a profound impact on the state's agrarian structure. It is also clear that indigenous people living in the forest ejidos of the Sierra Tarahumara reacted to PROCEDE by declaring their will to defend the collective ownership of the land. This comes from a cultural principle that is common to Indo-American people: the land should not be bought or sold because "*she is our Mother, she gives us sustenance and will receive us the day we die.*"⁶³

Table 3.3 Most Ejidos Choose to Maintain Social Control of their Land. April, 1999.

Total Number of Ejidos or Agrarian Centers in the State	Total Number of Ejidos Surveyed in the Sierra.	Number Requesting Surveying of Plots	Number of Ejidos Choosing to Maintain Social Control of Land
1,004	162	33	129

Source: INEGI, Informe 1992-1999 (July 1999); y Registro Nacional Agrario, August of 1998.

Many years will have to go by before more definite conclusions can be reached. However, the threat to the collective ownership of the land will continue as long as legal devices such as PROCEDE exist. Furthermore, as we will examine later regarding the Copper Canyon tourism mega-project, external pressures for the sale of ejido lands continue. (see **Chapter 7**)

During the presidency of Ernesto Zedillo, programs were implemented to generate part-time work in the most isolated and impoverished, rural areas of Mexico. The Rural Support Program (PROCAMPO), for example, was created

to stimulate cultivation practices in peripheral lands that had once been oriented toward forestry with the goal of improving or restoring them. Only agricultural plots smaller than 5 hectares (12.5 acres) are eligible for PROCAMPO. In 1999, PROCAMPO gave seven hundred pesos for every hectare under cultivation to stimulate production. These funds usually arrive after the harvest and are used to purchase fertilizer, buy corn, or to solve any pending family emergencies. It is also common to find situations where PROCAMPO benefits those who have the most land under cultivation. Because of the way PROCAMPO works, the program has

COSYDDHAC's Arguments against PROCEDE in the Sierra Tarahumara.

The implementation of PROCEDE in the Tarahumara began in 1993, and land ownership still has not been clarified in many parts of the municipality of Guadalupe y Calvo to the south. Colorada de la Virgen, Pino Gordo, Llano Grande and Mala Noche have some of the region's last stands of old-growth forest, representing the region's diminishing biodiversity. As of April of 1999, only 33 of the 162 ejidos surveyed chose to include the titling of agricultural plots and urban dwellings.

The legal basis used by COSYDDHAC to argue against surveying agricultural plots is found in Article 59 of the Agrarian Law, which states: "*all assigning of full ownership to plots in forests and jungles will be nullified . . .*" Also, Section VII of Article 27 of the Mexican Constitution states: "*The Law shall protect the integrity of Indigenous lands.*" COSYDDHAC also noted that: "*according to the calculated production potential of vegetable species in the State of Chihuahua, the municipalities of the Sierra have very low production potential for beans and corn. By definition, the ejidos of the Sierra are forest lands . . .*" Furthermore: "Agricultural plots in Indigenous forest ejidos have the following characteristics: 1. The average size of the plots is smaller than one hectare, 2. The poor soil produces an average of 0.771 tons of corn per hectare, and 3. Indigenous dwellings and agricultural plots are spread throughout the most isolated areas of the forest."* COSYDDHAC's legal initiative helped to guide surveys more toward the definition of borders between different land tracts, rather than measuring plots within each ejido.

* COSYDDHAC, *Certificación parcelaría en la Sierra Tarahumara*, Chihuahua, November 3, 1993.

Forest Ecology and Management, Vol. 103 (1998), 149-157.

⁵⁵ Toms and Betters, Op. Cit.

⁵⁶ Toms and Betters, Op. Cit.

⁵⁷ Instituto Nacional Indigenista (INI), *Pueblos Indígenas y Microdesarrollo en la Tarahumara*, Programa de Desarrollo Forestal Chihuahua-Durango. Delegación Chihuahua. *Seminario Permanente sobre Indigenismo*, Chihuahua, December 7 and 8, 1993, 71.

⁵⁸ Environmental Law Institute, *Legal Aspects of Forest Management in Mexico*, p. 47.

⁵⁹ World Bank, *Mexico Resource Conservation and Forest Sector Review*, p. 69.

⁶⁰ Through the reforms of Article 27 in 1992, the definition of small forest property was also expanded to just under 800 hectares, and regrouping of these properties was limited to a total area not larger than 25 times the size of this plot.

⁶¹ In 1992, changes in the Forestry Law further reduced SARH's controls on the UCODEFOs. With the changes of 1992, consultants concentrated their efforts on identifying areas of great commercial worth, and employed intensive cutting techniques. After the Forest Law was modified, consultancy associations sprang up in each of ten regions that cover the Sierra Tarahumara. These associations are: Unidad Forestal Casas

Grandes Babícora, (UCODEFO No. 2); El Largo-Madera, (UCODEFO No. 10); Socorro Rivera; Silvicultores de Tutuaca Oeste; Servicios Regionalizados de la Unión; Asociación de Productores de la Baja Tarahumara; Silvicultores Unidos de Guachochi; Región de Desarrollo Sustentable Aboreachi-Yoquivo; Productores y Responsables Técnicos Forestales del Sur del Estado; and Región de Desarrollo Sustentable San Juanito-Creel. World Bank, *Mexico Resource Conservation and Forest Sector Review*, p. 47.

⁶² *Procuraduría Agraria 1992-1999*. July, 1999.

⁶³ These words were recorded during COSYDDHAC's consultation process on the modifications of Article 27 of the Constitution in eight of the Sierra Tarahumara's forest ejidos in November, 1992.

Chapter 4

The Forest Sector in Mexico: from Limited Control To the Renaissance of *Laissez Faire*

Mexico has had forestry legislation since 1884—much of it focused on regulation and *de facto* control of natural resources. In fact, the language of Article 27 of the 1917 Constitution expressly includes conservation as a justification for the regulation of natural resource use.⁶⁴ In practice, however, the government's attempts to conserve forest resources through regulation have often been surpassed by forces outside the sector—such as general economic development, agricultural and land reform policies, and changes in international markets.⁶⁵ Beginning in 1992, these forces induced the Mexican government to abandon traditional command-and-control regulations, and rely instead on the market as the primary mechanism to regulate the forest sector. The liberalization of Mexican laws, meant to encourage and protect investment in the economy, has also changed the nature of the forest industry. Deregulation has encouraged lumber companies to merge and expand their operations, at times at the expense of the ejidos and the indigenous population of the Sierra Madre.

Based on these premises, we present here a brief outline of the political history of the Mexican forestry sector.

4.1 Historical Overview and Legislative Changes in the Forestry Law

The growth of the forest sector is a relatively recent development in Mexico. *“It wasn't until 1860 that paper pulp made from wood became economically*

*viable, particularly in North America and in the Nordic countries.”*⁶⁶ In the late 1800s, Mexico began to open its forest industry to large, foreign-owned lumber firms—primarily from the United States. Most of these firms were interested in the pine and oak forests of the Sierra Madre range. They built a number of large capacity sawmills in Chihuahua and Durango and constructed a dense network of forest roads.⁶⁷

Later, the forests of Chihuahua became an important source of raw material for U.S. industry. According to Francois Lartigue, *“During the latter half of the nineteenth century...the forests of the Sierra Tarahumara became an important supplier for the U.S. market.”*⁶⁸ During the dictatorship of General Porfirio Díaz, Governor Enrique Creel granted the first, large-scale forestry concessions to foreign companies in the state of Chihuahua.⁶⁹ One of the most notable concessions was Creel's grant to the Sierra Madre and Lumber Company, owned by William Randolph Hearst. According to Lartigue, *“On lands belonging to the Hacienda of Nahuérachi, belonging to the Hearst latifundio, several hectares of land were purchased from La Ciénega de San Pedro and La Sierra in order to build a lumber town. The new town was called San Pedro Madera and it sprang up around the Sierra Madre and Lumber Company's installations, also beneficiaries of a forest concession that allowed it to build sawmills in the districts of Galeana and Guerrero.”*⁷⁰ At that time, concessions also implied *“exemption from municipal and state taxes and the right to establish ‘tiendas*

de raya' (company stores)."⁷¹ In this manner, companies started to gain a foothold in the Sierra Tarahumara through government concessions.

Later, railroad construction made a large impact on the Sierra Madre's forest industry. Railroad construction made possible the transport of wood to its final destination. In fact, the railroad system in northern Mexico was designed almost exclusively for lumber transport. As Lartigue points out, "*From north to south, the construction of the railway converged on the forests.*" In 1905, Enrique Creel himself began laying railroad track along the stretch of the Sierra from Chihuahua to Tomochi as head of the Chihuahua al Pacífico Railroad Company, which he organized along with Alfred S. Splendove in New Jersey. Also in 1905, the Río Grande, Sierra Madre, and Pacific Railroad laid track from Ciudad Juárez to Nuevo Casas Grandes and Colonel William C. Green started laying track for the stretch heading due north from Tomochi.⁷² Finally, in 1907, the Río Grande, Sierra Madre and Pacific Railroad completed the track by reaching Ciudad Madera. Soon thereafter, however, the Mexican government expropriated property belonging to foreign firms and turned the railroads with their lumber mills over to national owners.

The Mexican Revolution of 1910 thus had a profound impact on the forest industry. It brought a swift end to the dominance of foreign-owned haciendas and gave rise to many changes in the agrarian property structure. Shortly after the 1910 Revolution, the Executive used presidential decrees to grant land and forest concessions to Mexican companies in the form of *Unidades Industriales de Explotación Forestal*.⁷³ Concessions were given mainly to those national industries that agreed to develop the land and all its

available resources. For example, the government conceded approximately 251,611 hectares to Bosques de Chihuahua to harvest wood in the region around Madera.

As **Table 4.1** indicates, Mexican forestry concessions and regulation can be divided into five distinct, historical periods of political and economic change. During each period, there were changes in both the market for forest products and the methods by which indigenous people gained access to forest resources.

4.2 The Period from 1917 to 1948.

The 1917 Constitution ushered in the first period of Mexican forest legislation (1917 to 1948). Article 27 of the 1917 Constitution defined the government's power and duty to distribute wealth from the nation's resources fairly. It declared: "The nation will have, at all times, the right to impose upon private property such conditions for uses [*modalidades*] as the public interest dictates, as well as to regulate, for the social benefit, the use of natural elements subject to appropriation, with the object of making a fair distribution of public wealth."⁷⁴ Article 27 also affirmed the need to establish "*adequate provisions, uses, reserves, and functions for land, water and forests...in order to preserve and restore ecological balance.*"⁷⁵

In 1926, the first Forestry Law allocated land for forestry development. Surprisingly, the law was especially progressive for its time and focused on preserving natural resources. However, land and agrarian reform largely neutralized the Forestry Law by promoting occupation of forestlands and granting open access to those who could convert land for agricultural or livestock use.⁷⁶ Indirectly, this encouraged the rapid

clear-cutting of forestland for agricultural reasons.

In Chihuahua, Grupo Chihuahua's industrial network began to grow during this period as the Vallina, group in association with Carlos Truyet, bought out the Ferrocarril del Noroeste's holdings. In 1952, Celulosa de Chihuahua S.A. de C.V.⁷⁷ was started in Ciudad Anáhuac, in the municipality of Cuauhtémoc. That same year, a concession of 613,445 hectares

(1,515,209 acres) was granted by presidential decree to the company Bosques de Chihuahua in order to supply the Anáhuac plant, Industrias de Madera, S.A. de C.V. and Maderas de Pino Industrializado, S.A. de C.V. with wood.⁷⁸ These industries worked in the municipalities of Madera, Ocampo, and Guerrero—areas once controlled by Randolph Hearst through the U.S. owned Sierra Madre and Lumber Company.

Table 4.1 Historical Development of Legislation and Forestry in Mexico: 1917-1999

Period	Applicable Laws	Method of Production	Social Access	Production	Market Factors
1917-1948 1	1917 Constitution; Forestry Laws of 1926 and 1943; Agrarian Reform of 1934	Forestry: French School of Forest Production	Forestry and Land Concessions	Period of intense initial development	
1948-1977 2	Forestry Laws of 1942 and 1960	American schools, also German and Finish schools	Large Plot Concessions	Period of even more intense development	
1977-1986 3	Forestry Law of 1986	Regular system of forest management	Loosening of social production and diminishing concessions	Period of greatest timber production: 10 million m ³ RTA	
1986-1994 4	1992 Forestry Law; 1992 Constitutional Reform; and NAFTA	Integrated Systems of Silviculture Management	Social production	Gradual diminishing of production	Elimination and reduction of regulations. Increase in imports
1994-1999 5	1994 Reform of General Ecology Law; 1997 Reform of the Forestry Law; NAFTA and WTO	Commercial Plantations	Increased social participation	Considerable increase in forest management plan approvals	Approval of direct financial subsidies to producers

Notes: 1 Método Mexicano de Ordenación (1958) y Método de Desarrollo Silvícola (1975)

Source: Afia Agroméxico, 1998

4.3 The Period from 1948 to 1977

During the period from 1948 to 1977, more forest concessions were turned over to *Unidades Industriales de Explotación Forestal*. The concessions only allowed Mexican-owned companies to harvest the pine and oak trees. Once *Unidades Industriales de Explotación Forestal* were created, they received 30-year land concessions, which permitted logging companies to exploit the forest and any other natural resources found on the land at their discretion. In Chihuahua, the Executive Branch gave concessions to the following companies: Ponderosa de Chihuahua, which operated in the lowlands of the Tarahumara; Chihuahua Industrial, which operated in the area around Morelos; González Ugarte which managed El Vergel and Guadalupe y Calvo; Comercial e Industrial Pacífico which controlled the Uruachi region, just up to the border with Sinaloa; and Bosques de Chihuahua, which continued with its concession in the Madera region.⁷⁹

Officially, the French School of silviculture was used by companies to harvest timber during the period. Then companies changed to the American School, and finally to the Finnish School of harvesting. The truth of the matter was that the forest was subjected to massive clear-cutting with little regulation under all three schools. Part of the production became fuel for the Ferrocarril del Noroeste (Northwest Railroad) and for the sawmills that ran on steam. Part of the timber production was sent to local industries, and massive volumes of wood continued northward to the United States.

4.4 The Period from 1977 to 1986

The creation of forest ejidos corresponded with the third period of forestry (1977-1986) when large amounts of forestland were granted to ejidos. The ejidal concessions ushered in a new era of production—social production—where forestry was divided among ejidos and companies. The Mexican government first devised communal property in an effort to administer Article 27 of the 1917 Constitution. The 1942 Forestry Law established the rules for conceding forestlands to ejidos. Even then, the endowment of forestlands was given slowly—over a period of 60 years—with the creation of ejidal land structure through land grants for collective exploitation. Until the constitutional reforms of 1992, ejido land essentially belonged to the state and could not be sold.

One important event during this period was the creation of the nation's largest forest ejido by presidential decree in the ejido of El Largo, municipality of Madera. On April 16, 1971 President Luis H. Echeverría rescinded the forest concession granted to Bosques de Chihuahua in favor of 1,455 farmers. With this gesture, President Echeverría effectively put an end to the system of granting concessions to national industries and announced the formation of state-controlled enterprises that came to be known as *para-estatales* [*empresas para-estatales*], or decentralized public organizations. These businesses essentially had monopoly power over harvesting of the forests. They provided technical forestry services to the ejidos, which used the opportunity to industrialize and commercialize their production. At the same time, private forest companies were prohibited from owning forestland, which effectively left

them dependent on ejido and community suppliers, as well as the small private landowners (private landholdings were limited to a maximum of 1,000 hectares).⁸⁰

This period also corresponded to the use of production methods that extracted forest products far beyond the forest's sustainable yield. The Method of Silvicultural Development (MDS), or Regular Forest method, was broadly promoted throughout the Sierra Madre. According to information gathered from government officials, "*During this period a huge number of permits for forest exploitation were granted without any prior economic studies. That really means that we cut into our future possibilities, exceeded the yearly volumes, and, at times, even cut two or three years worth in one year, until nothing was left.*"⁸¹

In Chihuahua, the company Productores Forestales de la Tarahumara (PROFORTARAH) was created formally as a state-owned company that operated until 1989.⁸² When it began, the Productos Forestales de la Tarahumara Company had an area of influence that included 20 municipalities, controlled by seven industrial centers. It was supposed to act as intermediary between the private sector and the forest ejidos, in addition to being a source of capital for the latter. Later, this company became involved in lumber marketing.

4.5 The Period from 1986 to 1994

In response to the massive clear cutting conducted by the *para-estatales*, the government heavily intervened in the Mexican forest industry during the fourth period of forest legislation (1986-1994). Beginning with the 1986 Forestry Law, government officials took an active role in managing the forest resource. The 1986

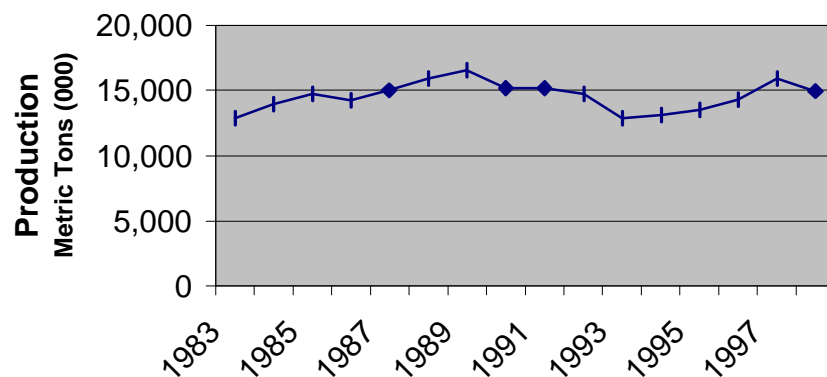
Forestry Law assigned institutional responsibilities for forestry to two main government agencies: the Ministry of Agriculture and Water Resources (SARH) and the Ministry of Social Development (SEDESOL). Within SARH, the Forest and Wildlife Subsecretariat (SFF) was responsible for the regulation of silviculture, soil conservation, and reforestation; the inventory of Mexico's forest resources; promotion of research (including nature reserves); and management of certain forested public lands.⁸³ 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 thus introduced much greater environmental regulation to the forest sector, with its oversight by two government agencies and requirements for forest management plans, transport permits, processing permits, and permit sales. The 1986 Law also required SARH and SEDESOL to: (a) regulate, monitor, and enforce compliance with forestry rules and (b) promote reforestation and conservation of public lands. However, the budgets for carrying out such activities were relatively small. For example, most of the operating budget of the SFF within SARH was concentrated in reforestation and fire control, leaving field officers little budget or time to conduct regulatory visits outside their headquarters.

Critics of SARH and SEDESOL argued that regulation by both ministries was burdensome for forest producers—ejidatarios and foresters alike—causing the gradual decline of forestry production between 1989 and 1995. See **Figure 4.1**. Between 1985 and 1990, for example, commercial wood production declined by 25%, pulpwood by 43%, and tropical timbers by 42%. Reduced production led

to increased wood imports, which were favored by policies of economic liberalization that followed Mexico’s signing of the General Agreement on Trade and Tariffs (GATT) in 1986. Imports of forest products increased from US \$500 million in 1981 to US \$1,000 million in 1992, to become the seventh largest category of imports from the U.S.⁸⁴

Figure 4.1 Mexican Forestry Production: 1983-1998 (Thousands of Metric Tons)



Source: Food and Agriculture Organization, *FAOSTAT Database Results*. (New York: United Nations, 1998) available at FAO website <http://www.fao.org>.

In response, the Forestry Law of 1992 was a concerted effort to reduce forest regulation. It replaced earlier regulatory requirements of both SEDESOL and SARH, and instead completely deregulated controls on the logging of timber, leaving the forest management plans as the only remaining regulatory mechanism for all forest projects. The new law also 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. Now the only regulation 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 change in the law

had catastrophic consequences: there was a substantial increase in clandestine logging, and the statistical documentation of annual wood production was made virtually impossible.

Nevertheless, the Forestry Law of 1992 did uphold the cornerstone of national forest policy—the forest management plan. The law required applicants seeking permission to harvest timber to either hold title to the land or hold a legal right to harvest its timber. Applicants also had to submit forest management plans written by qualified foresters and delineating the location of plots; the physical and biological characteristics of the forest ecosystem; the techniques that would be used for extraction, forestation, or reforestation; the measures that would be used conserve

and protect natural habitat; and the planning of necessary infrastructure, along with many other requirements.⁸⁵

Constitutional reforms of 1992 reflected a similar desire for political and economic opening. The 1992 reform of Article 27 of the Constitution introduced fundamental changes in land rights as (a) land redistribution was eliminated; (b) transactions of ejido lands were authorized; (c) ejido farmers were granted the right to sell their land; and (d) agrarian courts were created to solve land claim conflicts.⁸⁶ The reform of Article 27 also created new opportunities for the forestry sector. For example, after the 1992 reforms private companies could obtain up to 20,000 hectares of non-agricultural land for forest management or plantations.

In 1993, Mexico, together with two other countries, entered Canada's International Model Forest Program. Mexico located one of these projects in the Sierra Tarahumara – *Bosque Modelo Chihuahua* – close to Creel in the town of San Juanito, municipality of Bocoyna. The idea behind the program was for representatives of government, industry, non-governmental organizations and communities to join together in order to manage and promote timber production, forest conservation, and eco-tourism.⁸⁷ Through an NGO (*Asociación Civil*) they had created expressly to manage the program, forest engineers exercised control of the Model Forest Program in the Municipality of Bocoyna. The Model Forest Program, however, has been severely criticized for mismanagement of Canadian funds, for insufficient community involvement, for not incorporating other NGOs into the project and for a general lack of results.⁸⁸

4.6 The Period from 1994 to 1999

The changes that began in 1992 with the reformed Forestry Law, continued in 1994 with reform of the General Ecology Law and Mexico's participation in NAFTA, and culminated in 1997 with further reforms of the Forestry Law. During this period (1994-1999), Mexican forest legislation reflected a definite shift in governmental policy away from the regulatory approach of the previous period toward a paradigm that favored economic liberalization and the attraction of foreign investment. This shift was also reflected in the forestry sector, which was recovering from a deficit in wood production that had accumulated over the past decade.

The Mexican government reformed the General Law of Ecological Equilibrium and Environmental Protection [*Ley General de Equilibrio Ecológico y Protección 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). SEMARNAP subsumed the regulatory authorities of SARH and SEDESOL into a larger government structure. In the process, SEMARNAP was charged with: (a) defining the principles for ecological policy; (b) ecological management; (c) preservation, restoration, and improvement of the environment; (d) protection of natural areas, wild and aquatic flora and fauna; and (e) prevention and control of air, water and land pollution.⁸⁹ These duties also included managing and protecting Mexico's forestry resources.

The LGEEPA also created the Office for the Procurement of Environmental

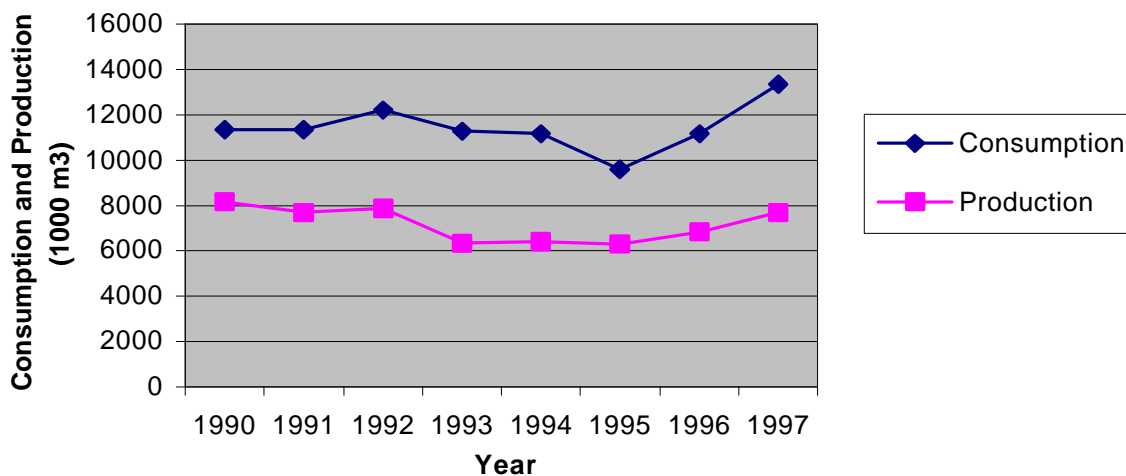
Justice (PROFEPA) to enforce environmental regulations, investigate the violations of environmental norms, and administer justice. Tarahumara and Tepehuanes of the Sierra have made use of the General Law of Ecological Equilibrium and Environmental Protection (LGEEPA) and the Penal Code to defend their forests from illegal logging by appealing to PROFEPA. (see **Chapter 6**)

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 the 1992 Forestry Law to deal with the problem of illegal logging by establishing systems of documentation and control for activities such as transport, processing, logging permits, cutting documentation and volume inventories.⁹⁰

During this period (1994-1999), Mexico started to recover from a deficit in commercial forestry, which quintupled between 1989 and 1994 to \$1.742 billion dollars. See **Figure 4.2**. Approximately 80 percent of the deficit corresponded to importation of pulp and paper.

Figure 4.2 Mexican Forestry Deficit: 1990-1997



Source: SEMARNAP, Reglamento Interior and *El Programa Forestal y de Suelo 1995-2000*.

**4.7 PRODEFOR and PRODEPLAN:
The Stage for the Multinational
Corporations**

Other products of the 1997 Forestry Law reforms were the Program for Forest Development (PRODEFOR) and the Program for Plantation Development (PRODEPLAN), which subsidize the production of wood from natural forests

and commercial plantations in order to supply the forest industry with needed raw materials.

PRODEFOR operates through subsidies and grants provided by SEMARNAP to timber companies and ejidos in order to improve their technical handling of forest resources.⁹¹ 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 22 million pesos in direct subsidies to ejidos, communities, and small forest properties, which permitted the incorporation of 316 thousand hectares of forested lands into timber production. Over 3,000 owners of lands have also received training through the program.⁹² 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 would cover 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 thousand hectares of commercial forest plantations in a period of 25 years. Though the reforms prohibited commercial plantations in areas where they would substitute 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.⁹³ In this favorable business climate, huge consortia have formed to establish commercial plantations in Mexico.

PRODEPLAN is a clear example of Mexico's new forest paradigm, with its focus on expansion of the forest industry through deregulation, subsidy and foreign investment. According to SEMARNAP figures, only 15,000 hectares were designated for commercial plantations in 1970. By 1996 and 1997, however, SEMARNAP approved 57 plantation projects covering a surface of 54,000 hectares through the PRODEPLAN program. (See **Table 4.2**) SEMARNAP later calculated that 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.⁹⁴

Table 4.2 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).⁹⁵ 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.

One of the largest backers of the new Forestry Law and PRODEPLAN has been PULSAR, a major manufacturer of cardboard in Monterrey which once owned companies in Chihuahua. One of the law's reforms permits private investors to plant trees on little-used lands, now often controlled by ejidos. The new law allows investors tax credits of up to 65 percent of the cost of plantations in exchange for immediate investments estimated at US \$1.3 billion. In press declarations including the newspaper, *La Jornada*, PULSAR announced that it would plant close to 1 million hectares over the next 25 years in Tabasco and Veracruz in order to produce cellulose.⁹⁶ In the southeastern states, most of the land slated for plantations belongs to communities or ejidos. In order to carry out projects on this land, a contractual agreement between the companies and the landowners must be reached. These contracts guarantee the duration and economic viability of the plantation.⁹⁷ As the case of Grupo Pulsar demonstrates, large companies now are making use of the concessions granted through recent developments of economic policy and forest legislation.

PRODEPLAN PROJECTS IN CHIHUAHUA

In 1991, Ponderosa Industrial S.A. de C.V. (PISA), a lumber consortium belonging to Grupo Chihuahua, started experimental plantation projects in the Sierra Tarahumara.¹ PISA launched a study to analyze conditions for establishing a commercial tree plantation in the municipality of Bocoyna. The results indicated that the transitional zones of the Sierra would be adequate for large-scale plantations as long as high quality native species were planted after the application of clear cutting and the removal of existing vegetation. A similar study was proposed for the ejido of Panalachi, Bocoyna, in which 2,000 hectares (4,942 acres) were to be converted into an experimental plantation. However, ejido members were violently opposed to the project, and the forestry authorities did not give their approval. In 1991, PISA launched a pine and eucalyptus pilot plantation project in the irrigation district of the Ojinaga desert. The project in this area, which receives water from the Conchos River, was combined with another in southern Sinaloa, El Carrizo.² However, the low yields in Ojinaga, in part due to a seven-year drought in Chihuahua, convinced PISA to abandon these initiatives.

In August of 1994, Plantaciones Industriales Mexicanas submitted a project for commercial plantations to the SARH under the name of "Programa de Manejo Forestal y Reforestación en Bosques de Bajo Rendimiento en la Zona Centro Oeste del Estado de Chihuahua." This experimental program was carried out in irrigation districts of Ojinaga and southern Sinaloa instead of in the Sierra.

In November 8, 1999, the COPAMEX consortium announced that would begin to integrate raw materials produced by its forest plantations in Southern Mexico into its operations in Chihuahua. COPAMEX announced: "*The species that were planted on the Pacific Coast, especially in northern Nayarit and southern Sinaloa, have passed the testing period. The eucalyptus produced in these plantations will be transported to Chihuahua where they will be sold to industries in order to produce high-quality paper.*"³ Meanwhile, ejido members and environmental groups continue to oppose these plantation projects.

¹ In 1993, part of the PISA consortium was sold to COPAMEX from Monterrey. M. Teresa Guerrero, "De bosques naturales a plantaciones comerciales: Los proyectos para Bocoyna" *Cuarto Poder*, Chihuahua, March, 1992.

² Guerrero, Op. Cit.

³ *Diario de Chihuahua*, 8 November 1999, Section B, page 5.

Smurfit Cartón y Papel, a subsidiary of the Irish giant paper maker Jefferson Smurfit, has also received project approval and tax breaks through the PRODEPLAN program. Other companies, like Kimberley Clark de México, are just beginning small-scale experimental eucalyptus plantations in the southeast.⁹⁸ The majority of the projects are relatively small in scale.

The PRODEPLAN model of forest production, however, has generated recurring criticism from environmental groups. Several large projects are growing non-native species such as eucalyptus trees and other exotic species. Environmental groups emphasize that: (a) much of the land designated for these rapid-growth commercial plantations is currently being used for the small-scale production of foodstuffs; (b) the use of agro-chemicals tied to *Green Revolution* technology has had negative impacts on soil, groundwater, and running water; (c) commercial production is devastating the rural economy and increasing the farmers' dependence on imported beans and corn; and (d) the importation of "improved" hybrid seeds and genetically engineered seeds is forcing farmers to purchase and apply complete technological packages with serious ecological, biological, economic, and cultural consequences. Never before in the history of Mexico has the country been so dependent on importing corn for domestic consumption. Environmental groups also oppose the monoculture planting of timber plantations—especially the unchecked planting of eucalyptus trees, which can deplete soils, reduce biological diversity and require high chemical applications.⁹⁹

4.8 Tariff and Non-tariff Deregulation: NAFTA and GATT

Recent deregulatory proposals have also resulted from Mexico and the United States' membership in the World Trade Organization, which formed in 1995. The WTO has discussed ways to increase free trade in forestry products through the elimination of tariff barriers. While a recent report found that the elimination of tariff barriers would likely have a relatively low impact on most countries, because tariffs on forest products are already very low, WTO discussions on forestry could have potential impacts on Mexican forestry practices.¹⁰⁰ Eliminating all obstacles to the commerce of forest products is problematic because increased production may have a profound effect on biologically and culturally diverse habitats, often diminishing important storehouses of carbon and forever altering indigenous peoples' homelands. Because of these risks, environmental groups successfully convinced the U.S. Trade Representative to conduct an environmental analysis on the impact of liberalizing all forest products.¹⁰¹ The primary concern is that free trade in countries with weak environmental and sustainability codes, such as Mexico, will promote further predatory forest practices.

Proposals to eliminate non-tariff barriers are even more alarming. For example, at a meeting held in late 1999 in Seattle, World Trade Organization members discussed a proposal from the Asia-Pacific Economic Cooperation (APEC) members regarding removal of laws and practices that could be considered as trade barriers (so-called non-tariff barriers). Because these reforms may well eliminate the consumers' right to have access to information about how products they

purchase are produced, environmental groups are very wary of their effect on some regulatory programs. Such is the case with voluntary programs—such as the one run by the Forest Stewardship Council—and other regulatory programs that allow companies to label forest products that are harvested in a sustainable way. These programs allow consumers (and importing countries) to know how a product was produced. However, because Article III of GATT requires all countries to treat an imported product just as it would a similar domestically produced product, the law may be interpreted to limit the ability of a country to restrict how a product was produced—even by labeling.¹⁰²

Other WTO proposals might impede the ability of countries to require responsible environmental practices. The removal of these types of "barriers" could hinder the ability of governments to safeguard the forests, especially in countries like Mexico where monitoring is lax and environmental and social laws are arbitrarily enforced.¹⁰³

Trade liberalization under NAFTA may pose similar limitations on countries' efforts to strengthen their environmental laws. On January 1, 1994, NAFTA officially went into effect. When it went into effect, NAFTA reduced tariffs on forest product exports from Mexico to the U.S. and Canada, while import tariffs on most forest products from the U.S. and Canada were lowered by 10 to 20 percent. By 1999, many of these import tariffs had been eliminated, leaving Mexico's domestic producers to compete directly with the largest timber and paper manufacturers in the world.¹⁰⁴ Not surprisingly, Mexican producers now face significant disadvantages because their products bring much lower prices than those of the U.S. and Canada. This may go a long way to explain the recent

logging fever unleashed on the pines of the Sierra Tarahumara: low prices demand high volumes.

Under Article 14 of the environmental side agreement to NAFTA, a citizen or private organization can submit a complaint to the North American Commission on Environmental Cooperation against a government for failure to effectively enforce its environmental laws. Nonetheless, the agreement specifically excludes resource extraction and management laws—related to fishing, mining and forestry—from this complaint process. Under Article 14, any complaint concerning failure to enforce laws related to forestry would have to be limited to environmental regulations, such as the protection of unique endangered habitats or protection of water quality.

Both the GATT and NAFTA specifically do allow government participation in the forestry sector for infrastructure, investigation, training, assistance and studies, and ecological programs, as well as direct subsidies to producers.

4.9 Conclusion

One may argue that the history of the Mexican forest sector is dotted with the success and failures of a country looking to step out of the shadow of its larger neighbors. On one hand, Mexico is Latin America's second largest papermaker (after Brazil). Mexico is also the largest producer of forest products among the countries of the G3—its trade agreement with Columbia and Venezuela.¹⁰⁵ On the other hand, its proximity and relationship to the United States has long overshadowed Mexico's trade with other Latin American countries. The tenuous relationship between Mexico and the United States continues today. While the countries cooperate as trade partners in

belonging to José and Mario González Múzquiz

(sons of González Ugarte)—began to work the forests in the southernmost municipality of Guadalupe y Calvo in 1969. INI, Op. Cit, p. 23.

⁸⁰ World Bank, *Mexico Resource Conservation and Forest Sector Review*, p. 34.

⁸¹ This comment was taken from an interview with a government official from that period whose identity will remain confidential at the request of the interviewee. Chihuahua, October 1998.

⁸² INI, Op. Cit. p. 28.

⁸³ Environmental Law Institute, *Legal Aspects of Forest Management in Mexico*, p. 43.

⁸⁴ World Bank, *Mexico Resource Conservation and Forest Sector Review*, p. 58.

⁸⁵ World Bank op cit at p. 71.

⁸⁶ World Bank, *Mexico Resource Conservation and Forest Sector Review*, p. 69.

⁸⁷ Comisión Nacional Forestal, Página de Web (<http://www.semarnap.gob.mx/ssrn/conaf/ic.htm>).

⁸⁸ Instituto Nacional Indigenista, *Pueblos Indígenas y microdesarrollo en la Tarahumara*. Programa de Desarrollo Forestal Chihuahua-Durango. Delegación Chihuahua. Seminario Permanente sobre Indigenismo. Chihuahua. December 7 and 8, 1993. p 40 y 41 and INI, *Self Government* 10 y 11, 1998.

⁸⁹ World Bank, *Mexico Resource Conservation and Forest Sector Review*, p. 73.

⁹⁰ SEMARNAP, "Reformas a la Ley Forestal," available at <http://www.semarnap.gob.mx/ssrn/DGForestal/comentfores.htm>

⁹¹ PRODEFOR. *Diario Oficial*, August 24, 1997.

⁹² SEMARNAP, "El sector forestal de México: Situación actual y perspectivas," 1999.

⁹³ NRDC, "A Season in Antequera: Report on Activities in Oaxaca, Mexico," Jan.1-June 30, 1997

⁹⁴ SEMARNAP, "Programa para el Desarrollo de Plantaciones Forestales Comerciales," available at <http://www.semarnap.gob.mx/programa98/capitulo2/sld002.htm>

⁹⁵ Secretaría de Recursos Hidráulicos (SARH), *Proyectos de Plantaciones Forestales Comerciales del Grupo PULSAR Internacional*, México, June, 1995. Grupo Pulsar Internacional of Monterrey is directed by Ing. Alfonso Romo Garza. Since June 1992, this group has promoted a project, based on the Aracruz Forestry Model in Brazil, for the establishment of large-scale commercial plantations in the states of Campeche, Tabasco and Chiapas. For this purpose, PULSAR created the Desarrollo Forestal Company S.A. de C.V. head-quartered in Villahermosa, Tabasco.

⁹⁶ Ross, Op.Cit.

⁹⁷ "Mexico Enacts New Forestry Law," *Wood Technology*, 17 July 1997.

⁹⁸ Kimberley Clark de Mexico, Personal Letter, December 1, 1999.

⁹⁹ Ross, Op. Cit.

¹⁰⁰ Nigel Sizer, David Downes and David Kaimowitz, *Tree Trade: Liberalization of International Commerce in Forest Products: Risks and Opportunities* (World Resources Institute and Center for International Environmental Law).

¹⁰¹ National Wildlife Federation, "NWF Welcomes Green Assessment of Plans to Liberalize Trade in Forest Products," November 2, 1999.

¹⁰² National Wildlife Federation, "What's Trade Got to do With it?" (Washington: NWF, 1999), 10.

¹⁰³ Sizer, Downes et al. Op. Cit. p. 3.

¹⁰⁴ Gonzálo Chapela y Mendoza, "Panorama del Sector Forestal en México," Gaceta No. 38 available at <http://www.ine.gob.mx/gacetas/gaceta38/pma27.htm>

¹⁰⁵ Maria Rosario Mamolejo De Daste, "Mexico: On the Rebound," *Papermaker* (Mount Prospect, IL: Paper Industry Management Association, Vol. 79 No. 8, August 1997) p. 25.

Models of Timber Extraction

The forest industry in the state of Chihuahua is centered on three co-existing models of forestry production known as: (1) the Leasing model; (2) the Industrial model; and (3) the Transformational model. Within all three models, private industry negotiates contracts with ejidos each year to gain access to forest resources. Some of these contracts have benefited the ejidos, providing them with much needed financing to pay for forestry projects. The majority of contracts, however, have failed to improve the lives of the Sierra's indigenous population, often leaving forest ejidos in debt to lumber companies or subject to the manipulation of outside authorities. At times, these models have also promoted the *cacicazgo*, by involving ejidos in highly inflexible regulatory processes.

5.1 The Leasing Model

Most lumber production in the Sierra Madre of Chihuahua occurs under the leasing model. Ejidos enter into the leasing model because they do not possess the capital needed to pay for forestry expenses, such as purchasing the machinery to construct roads, paying for environmental impact studies required by government regulation, or obtaining permits needed to extract wood. The money to pay for these expenses comes from a variety of different sources, the majority of which are supplied by lumber companies in exchange for guarantees of wood. Through the Leasing model, lumber companies set the terms of the lease and determine the contractual

conditions under which ejidos may borrow, often at rates unequal for the ejido. The timber is contracted in its primary condition as standing pines or *trozos* (literally "chunks," meaning logs).

Lumber companies also control the forest industry by financing local transportation companies.¹⁰⁶ The lumber companies usually provide money to private individuals to purchase their trucks. Lumber companies also guarantee credit for truck repairs and tires after the truck's purchase. In exchange, the owner of the truck is obligated to pay off the debt to the company by transporting large volumes of wood from his forest ejido. Before thinking of preserving the forest, he thinks of paying for the truck; so that the stimulus is always to log more wood in order to pay off the debt.

The social and environmental costs of the leasing model have been extremely high in the Sierra Tarahumara. Its effects include chronic and dire poverty, the disenfranchisement of poor farmers, the destruction of traditional cultures, and the growing deterioration of the forest. When a company buys pines standing in the forest, it assumes responsibility for all the activities related to their harvest: cutting, clearing, and dragging. Ejidos and forest communities promise lumber in advance of the loan and remain permanently indebted to the lumber companies thereafter. Thus, the Sierra's inhabitants become poorer with debts that will be passed on to their children. These very real costs have never entered into the calculation of production expenditures, and the effects on many ejidos have been disastrous.

5.2 The Industrial Model

Another forestry model promoted by the Mexican government during the last half-century has been the Industrial forestry model. Originally, the Mexican government intended to reduce the dependence of forest ejidos on private and state-owned companies to log and mill their wood. The Industrial model promoted industrial development of the ejidos through government-sponsored programs. Forest ejidos were allowed to establish their own sawmills and to supply paper and other forest products to the domestic market. Unfortunately, the Mexican government only made half-hearted attempts to encourage ejidal industrialization. This left mostly inefficient and obsolete industrial plants in the hands of forest ejidos. During the 1990s, the government removed most of the price controls that supported ejido-owned industries, exposing them to competition from foreign and domestic companies. As a result, relatively few sawmills remained in the hands of forest communities, while privately owned companies increased their control of the forestry market.

To set the industrial forestry model in motion, the Mexican government spoke of transferring several state-owned businesses to forest communities in order to attract private capital. Unfortunately, the government never took steps to ensure the smooth transfer of state-owned businesses to the ejidos. Instead, the transfers created many problems. In the case of Chihuahua, for example, the government started to transfer of the state-owned company Productores Forestales de la Tarahumara (PROFORTARAH) to the forest ejidos. However, the government stopped short of directly handing control over to the ejidos and instead handed control to a

series of external administrators, beginning with the National Indigenous Institute (INI), followed by SARH, and later the General Felipe Angeles Rural Association for Collective Benefit (ARIC).¹⁰⁷

When it began, PROFORTARAH assumed the responsibility of regulating all of the business between ejidos and private companies in the Sierra Tarahumara. It had an area of influence that included 20 municipalities, controlled by seven industrial centers. PROFORTARAH was supposed to act as intermediary between the private sector and the forest ejidos, in addition to a being source of capital for the ejidos. Nonetheless, the operations of PROFORTARAH in Chihuahua did little to improve the industrial capacity of the ejidos or to train young farmers in forest production. As one study mentions, “*Contrary to expectations, PROFORTARAH promoted the irrational extraction of forest resources and has not achieved the proposed objectives. Furthermore, the living conditions of the true owners of the forest have not improved, and poverty has grown.*”¹⁰⁸

The National Indigenous Institute (INI) first assumed control over supervising the economic organization of forest ejidos in July, 1957. According to Juan Luis Sariago, a prominent Mexican anthropologist, “*The INI’s intervention in forest matters led to two important consequences: First, it gave the INI the power to interfere in the administrative, policy formulation, and decision-making processes of indigenous forest ejidos, which, beyond any shadow of a doubt, gave rise to clear patterns of paternalism. Second, it helped to diminish the autonomy and influence of the logging companies that, up until the arrival of the INI, had exploited forest resources without establishing any contracts with*

the ejidos. In the best cases, some companies paid paltry sums for the right to use the forest. However, even though INI representatives had theoretical discussions about indigenous control of the sawmills, in practice, the ejidos had to enter into contract with the logging companies to carry out the many processes involved in forest exploitation, especially those related to exploitation and sales."¹⁰⁹ During the 1980s, the INI was charged with supervising the transfer of PROFORTARAH to the ejidos of Chihuahua.

PROFORTARAH, however, was never directly handed over to the forest ejidos. Instead, it was transferred through a complex network of organizations including the INI and later the General Felipe Angeles Rural Association for Collective Benefit (ARIC). With a loan organized by the INI, ARIC was to divvy up what was left of PROFORTARAH's assets—which once rose to over 1,000,000 pesos (more than 340,000 dollars at the time)—to the peasant farmers of Chihuahua. ARIC controlled the transfer of PROFORTARAH from the top of the organizational pyramid. It grouped 149 ejidos and forest communities into nine Unions of Ejidos, representing the second level of organization. The Unions were to process the wood, milling it into beams and boards, and then pass it on to ARIC.¹¹⁰

ARIC also used the Unions of Ejidos for political purposes to solidify an alliance between the federal government and local farmer leaders who belonged to National Confederation of Farmers (CNC)—an affiliate of the Institutionalized Revolutionary Party (PRI)—and the Workers and Farmers Union (UNORCA), a syndicate that had once been independent of the government. Under ARIC's administrative structure, forest ejidos

became the bottom tier of the organization. The ejidos were to supply the raw material to the nine Ejido Unions. Critics of this policy shift believed it was intended to subordinate rural leaders of the ejidos to the government and oblige them to accept the changes to Article 27 that Salinas de Gortari sent to the Congress in October of 1992.

On February 8, 1989, the Union of Ejidos signed an agreement transferring the assets of PROFORTARAH.¹¹¹ By 1991, however, the rural representatives of the Union of Ejidos and ARIC were at odds over how to spend the revenue from PROFORTARAH.¹¹² The cost of continuing PROFORTARAH's operations was exorbitant because the forest ejidos were more disorganized and poorer than ever before. The political organization under ARIC did little to integrate the activities of the forest industry beyond forming Unions of Ejidos to manipulate voting practices. Thus, ARIC and its Unions became yet another pillar in the *cacicazgo* structure. Ejidatarios were again exposed to the decisions of corrupt ejido and government officials and their forest resources were also over-harvested.

5.2.1 Sawmills in the Industrial Process

Since 1977, the official Mexican policy has been to promote saw milling in forest ejidos in order to increase ejido participation in the industrial forestry sector. Milling adds value to the primary logs taken from the forest and provides ejidos with an industrial base for their forestry operations. However, the government's half-hearted attempts to push industrialization forward in the forest ejidos during the 1990s left relatively few sawmill facilities in the hands of ejidos and forest communities. Instead privately owned sawmills grew in

their place. In fact, statistics reveal that private sawmills proliferated far in excess of socially owned sawmills, surpassing them by 96% in 1998.

In 1993, there were 43 sawmills on ejido lands in Chihuahua, and another 65 belonged to private owners. Beginning in 1994, however, private sawmills were built at a much faster rate in the Sierra Tarahumara and on the outskirts of many of the region's towns including San Juanito, La Junta, Cuauhtémoc, Parral, and Baborigame.¹¹³ By 1998, there were 309 sawmill facilities located in the state of Chihuahua—104 owned as social property and 205 owned privately. (see **Table 5.1**) While ejido sawmills had grown by 142%, privately owned sawmills grew by more than 215%.

Table 5.1 Sawmill Facilities in the State of Chihuahua in 1998

Areas*	Social Property	Private Property
27	104	205
Total	Band Saws	Circular Saws
309	236	74

Source: SEMARNAP, Chihuahua Delegation, 1998

- All of the Sierra's 19 municipalities are included in these statistics, and eight of the twenty-seven areas are not in the Sierra. These include cities and towns outside the Sierra that have sawmills like: Parral, Santa Bárbara, Chihuahua, Cd. Juárez and Janos.

In 1998, 104 sawmill facilities located in the state of Chihuahua were owned as social property and 205 were owned as private property. Socially owned sawmills were located in the municipalities of Balleza (8 mills), Guadalupe y Calvo (12), Guachochi (16) and Madera (15). Private sawmills, on the other hand, were spread throughout 27 areas, 19 of which correspond to municipalities of the Sierra where there are forest resources,

including the municipalities of: Balleza (19 mills), Bocoyna (31), Cuauhtémoc (26), Guadalupe y Calvo (30), Guachochi (29), Guerrero (28), Parral (29), Madera (27), and Ocampo (23).¹¹⁴ While eight other private sawmills are located outside the Sierra region.

Of the 309 sawmills registered in 1998, 206 use band saws designed to handle logs greater than 30 cm (approx. 12 inches) in diameter. Pines of this diameter are becoming scarcer every day in the Sierra, with the exception of the municipalities of Guadalupe y Calvo and Guachochi, which lie in the most inaccessible regions of the Sierra Tarahumara's Highlands. The extensive use of band saws is proof that great pressure is being brought to bear on the Sierra's largest and oldest trees.

Without government support, ejido sawmills were rapidly exposed to the rigors of the free market. In general, ejido sawmills are antiquated and operate without modern computer systems or modern machines that can process wood in large and complex dimensions. Many ejidos also view their timber enterprises as a means of generating local jobs, putting pressure on the managers of the timber enterprises to generate more days of work and more jobs than to maximize profits.¹¹⁵ Under these conditions, the high costs and inefficiencies make ejidal forest industries uncompetitive in the open market.¹¹⁶

However, the expansion of private sawmills also represents a failure of the industrial model. Privately owned sawmills contribute little to solving the poverty and unemployment of peasant farmers living in forest ejidos. As the number of private sawmills grows, forest ejidos become primarily the suppliers of wood for the sawmills, instead of developing the necessary industrial capacity to mill their own products.

Another effect brought on by this rapid growth of sawmills is competition between ejidos and private loggers for the best wood, which has created a race to find the best wood and exerted massive pressure on forest ecosystems. Private sawmills have also grown at an incredible pace—215% over a five-year period—which suggests that the government is not regulating their growth. In some areas, there are as many as three sawmills along the road that receive logs from several different ejidos.

5.3 The Transformational Model

The Transformational model adds greater value to raw materials by providing finished products such as: packing crates, beams, posts, railroad ties, molding, veneers, pressure board, paper, and plywood to the market. Currently, the majority of transformational industries in Chihuahua are privately owned. Private companies and huge consortiums carry out most transformational activities because very few forest ejidos have the organizational or administrative skills and the industrial hardware needed to perform these tasks.

After adoption of the 1992 Forestry Law, there were virtually no government controls or regulations on the forest industries, especially the pulp industry. As a result, a rapid series of mergers occurred in the forest industry, leaving few socially owned transformation companies. (see **Figure 5.1**) In 1993, for example, there were 80 crate factories in Chihuahua, 11 of which were owned as social property and 69 of which were privately owned. By 1998, however, the number of crate factories registered in Chihuahua fell to 36, all of which were privately owned—meaning that ejidos no longer participate in crate production. The

only socially owned forest industries registered in 1998 were: one furniture factory and one kiln in the Union of Ejidos of Bocoyna; one kiln in the Union of Ejidos of Guerrero; one kiln in the Union of Ejidos of Sierra Madre de Paral; and two splinting machines, two bark strippers, and two kilns in the Ejido of El Largo.¹¹⁷

The number of plywood and molding factories has also increased, a phenomenon probably related to the opening of new national and international markets. One of the most visible consequences of this has been intensive logging of trees larger than 12 inches in diameter, which has led loggers to invade the last old-growth stands in Guadalupe y Calvo.

However, installed capacity in both the pulp and paper industries remains rather low. Together with plywood production these industrial branches are the state's most important forest-related industries. Unfortunately, because of the cost of transport, the inefficiency of equipment, and the absence of long-term capital investment these industries have a low capacity utilization. For example, if one takes into account the installed capacity of the state's lumber companies, plywood manufacture could account for more than 6 million cubic meters of production; the pulp industry for nearly 600,000 cubic meters, wood kilns for almost 500,000 cubic meters, crate and chipping factories for more than 350,000 cubic meters, and molding and pressure-board manufacture for more than 100,000 cubic meters. (See **Table 5.2**) Even though these industries are operating below capacity there is still significant natural resource depletion in the forests of Chihuahua. If these industries operated at capacity, the depletion would be even greater.

Table 5.2 Transformational Industries in the State of Chihuahua in 1998

Industrial Category	Total	Installed Capacity	Real Capacity (in Board Feet)
1. Crates	36	126,000	71,744
2. Furniture	7	5,898	4,098
3. Chipping	8	242,500	195,000
4. Molding	17	179,055	136,025
5. Pulp	1	600,000	480,000
6. Paper	2*	144,000	133,674
7. Plywood	9	6,219,800	5,802,080
8. Wood Kilns	51	488,658	302,730
9. Veneers	1	65,000	31,000
10. Particle Board	2	187,500	179,250
TOTAL	132	8,175,911	7,405,351

Source: SEMARNAP, Subdelegation of Natural Resources, Inventory of industries operating in the State. Summary made by authors. *The SEMARNAP information does not include figures from Papelera de Chihuahua, S.A. de C.V. (COPAMEX), the company that utilizes used paper as its raw material for manufacturing recycled paper.

A Negative Example of the Transformational Model: Pulp Industry

Until the mid 1990s, the supply of raw materials for Chihuahua’s pulp industry came from dead pine trees and secondary byproducts from green trees: smaller logs and tree tops. This supply of cellulose was readily available and was a good example of using byproducts to develop sustainable forestry practices. By 1994, however, companies led by COPAMEX and followed by International Paper Company (IPC) developed a new cellulose model using small diameter trees.¹ These companies developed a new market for small diameter trees ranging from eight to fifteen centimeters (three to six inches). Logging small diameter trees for pulp increases the homogenization of the forest, and creates natural seedling plantations, leaving genetically disabled forests behind. The expansion of these companies in Chihuahua has also had negative consequences for the forest ejidos of the Sierra Tarahumara.

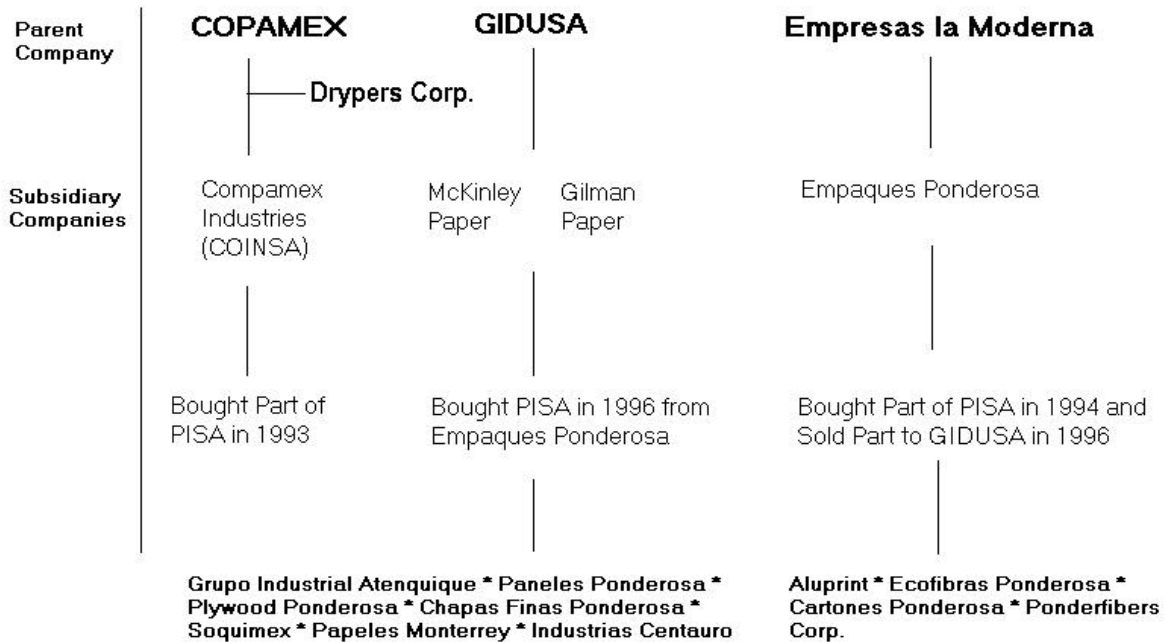
Massive clearing operations were launched to support the new pulp model. Small trees were cut down in order to allow seedlings to prosper and reduce competition between the larger trees. This procedure had never been used before in the Sierra Tarahumara because the forest technicians never included it as part of their Forest Management Programs. Nevertheless, SEMARNAP approved the new pulp operations once the companies submitted their plans. According to some observers, these forestry procedures create vast seedling forests that will need from 80 to 120 years in the Sierra Tarahumara’s soil and climatic conditions before they can be considered mature. The boom culminated in October of 1996 when 13 members of the San Alonso Ejido, municipality of Urique lodged a complaint for illegal and excessive logging against intermediary loggers who were handling the IPC contract.

A meeting was held in San Rafael between representatives from SEMARNAP, Forestales Asociados, S.A., Miguel Fontes (an ejido member), the International Paper Company, and COSYDDHAC to resolve the problems of over-clearing in the Sierra Tarahumara.²

¹ In 1986 and 1987, there was a project in the Chocachi Ejido in the municipality of Guerrero to use an intensive clearing scheme in order to supply the Anáhuac cellulose factory with pulp material. However, this procedure did not prosper because the market did not sustain demand.

² COSYDDHAC Archives, “Meeting minutes from the visit to San Alonso Ejido, Chihuahua,” 26, 27 and 28 November 1996. “The November 26 meeting in San Rafael, Municipio de Urique, was attended by Engineer Francisco Javier Musalem Lopez, from the main office of SEMARNAP; Engineer Oscar Estrada Murrieta, Sub-Delegation of Natural Resources; Engineer Harry Archer; Engineer Carlos Gonzalez Vicente and Marina Cintron from the International Paper Co.; Engineer Refugio Luna Gracia, from Forestales Asociados S.A.; Miguel Frias Fontes, ejido member; M. Teresa Guerrero and Carlos Ochoa Pbro, representing COSYDDHAC. One of the concepts explained by Engineer Archer was that “*you take as much wood from the forest as you leave behind.*”

Figure 5.1 Company Mergers in Chihuahua's Forestry Sector (1990s)



5.4 Capital Re-structuring in the Forestry Sector

Company mergers have shaped the forest industry in the state of Chihuahua during the last 40 years. The 1990s saw a culmination of these mergers as three large companies consolidated their control of the wood products market. The three companies include the Monterrey-based consortium Corporación Papelera Mexicana (COPAMEX), Grupo Industrial de Durango (GIDUSA) and Empresas la Moderna. These companies established vertical control over the forest industry by buying or merging with smaller companies and by readily adapting to changes in the economy, changes in the timber market, and changes in forestry legislation.

COPAMEX is currently the second largest maker of consumer paper products in Mexico (after Kimberly-Clark).¹¹⁷ Founded in 1928, COPAMEX consists of three divisions: industry, tourism and real estate. The company owns the rights to the Scott brand of tissue paper in Mexico,

and its products include bathroom and facial tissue, feminine hygiene products and packaging for construction products, including cement bags. COPAMEX Industries, S.A. de C.V. (COINSA) is a subsidiary and is currently one of Mexico's main paper producers. COINSA's cellulose and paper operations include one cellulose plant, two fiber plants and five paper plants in the states of Chihuahua (2), Nuevo León (2), and Michoacán (1). COPAMEX also has one feminine hygiene products factory, one packaging center, and one forestry center in Chihuahua.¹¹⁸

In late 1993, COPAMEX began merging with smaller companies by buying stock from what had been Grupo Chihuahua's consortium Ponderosa Industrial S.A. de C.V. (PISA).¹¹⁹ The sale of stock from PISA's principal companies started the reorganization of Chihuahua's forest industry. The PISA consortium included the company Plantaciones Forestales Mexicanas S.A. de C.V. and was composed of several companies that produce cellulose, paper,

cardboard and plywood in factories concentrated among the ejidos in northern Chihuahua.¹²⁰ In April of 2000, COPAMEX reached an agreement with Drypers Corp. (Houston, Texas) allowing Drypers to manage existing manufacturing operations in Mexico while COPAMEX manages sales and distribution.

Empresas la Moderna is another large paper and pulp company that once operated in Chihuahua. Based in Monterrey, Empresas la Moderna is the leading Mexican cigarette manufacturer. It also controls Empaques Ponderosa, Mexico's top producer of recycled-based boxboard. In December of 1994, Empresas la Moderna acquired its operations in Chihuahua by buying the cash-strapped Ponderosa Industrial, S.A. de C.V. (PISA) from COPAMEX.¹²¹

Empresas la Moderna once owned the following companies: Ponderosa de Chihuahua S.A., Ecofibras Ponderosa S.A., Ponderfibers Corp., Páneles Ponderosa S.A. Soquimex S.A., Plywood Ponderosa S.A., Chapas Finas Ponderosa, and Bosques de Chihuahua S.A.¹²² It sold most of these subsidiaries to Grupo Industrial Durango in 1996 and terminated its activities in Chihuahua.

Grupo Industrial Durango S.A. de C.V. (GIDUSA) is the third company that enjoys significant control of the wood and paper products market in Chihuahua. GIDUSA was formed in 1975 from the combination of a forest products transportation company and a regional wholesaler of building products. CEO Miguel Rincon and his family now control about 60% of GIDUSA. Since its creation, GIDUSA has expanded by acquisitions and internal expansion to become the leading packager in Mexico (packaging products account for around 70% of sales).¹²³ Among its operations are the McKinley Paper Company based in

New Mexico and Gilman Paper based in Georgia (kraft and writing paper, packaging). About 60% of GIDUSA's exports are generated by sales to NAFTA-member countries, with about 18% coming from the US.

In 1988, GIDUSA bought the companies belonging to the state consortium Grupo Industrias Atenquique, now named Envases y Empaques, from NAFINSA. GIDUSA went on to acquire Papeles Monterrey, Industrias Centauro, Compañía Papelera de Guadalajara y Papelera Texcoco. In 1994, it bought Empresas de Cartón Titán from Grupo Alfa.¹²⁴

In 1996, GIDUSA acquired a series of smaller companies in Chihuahua including Páneles Ponderosa, the pressure-board company; Soquimex S.A., Plywood Ponderosa S.A., and Chapas Finas Ponderosa from Empresas la Moderna.¹²⁵ GIDUSA also acquired a cellulose and paper factory in Anáhuac; the plywood company, Ponderosa de México; and the Plantaciones Mexicanas Company.

In recent years, local capital in the plywood, pressure-board and kiln industries has also been re-structured. A new industrial group has emerged due to a large-scale change in the composition of stockholders in the following companies: Duraplay of Parral, S.A. de C.V. (pressure-board and plywood), Ponderosa Industrial S.A. de C.V. (molding and kiln), Manufacturas Ponderosa S.A. de C.V. (kiln), Central Maderera de Parral (kiln), DINTEK S.A. de C.V. (kiln), and Triplay de Chihuahua S de R.L. de C.V. (plywood).

Another company that once held investments in Chihuahua is the International Paper Company (IPC). After becoming involved in forestry disputes with the San Alonso and Cusare ejidos (see **Chapter 6**) IPC

Historia -Unidad Chihuahua-. Published by Fideicomiso para la Cultura México/USA. 1998. Chapter V. For more information about the INI and forest resources of the Tarahumara, see: INI , *Pueblos Indígenas y microdesarrollo regional*. 1993. pp. 30-32.

¹¹⁰ INI, Op. Cit. p.29.

¹¹¹ The ejido unions that signed the agreement on Feb. 8, 1989, under which PROFORTARAH's assets were transferred were the Unión de Ejidos Forestales zona Urique, Unión de Ejidos y Empresas Ejidales del Municipio de Guachochi, Unión de Ejidos del Noroeste del Municipio de Ignacio Zaragoza, Unión de Ejidos Norte y Centro de la Tarahumara del Municipio de Bocoyna, Unión de Ejidos y Comunidades zona Tomochi, Unión de Ejidos Sierra Madre de los Estados de Chihuahua y Durango y Unión de Ejidos Gral. Francisco Villa del Municipio de Guerrero.

¹¹² One of the cries of the 1910 Revolution was "Effective Suffrage and No Re-election". One of the negative manifestations of no re-election in Mexican politics is popularly known as the "año del hidalgo", which refers to the last year of the six-year term or "sexenio". Unfortunately, it is common that during this year

government officials make public monies disappear as by an act of magic. The incoming administration blames the former one for such unscrupulous excesses, and then usually repeats the cycle at the end of its reign. The complicity between the outgoing government and the newly elected government is such that any attempts to prosecute officials for extortion are both rare and unsuccessful, often leading to the imprisonment of two or three scapegoats to placate public indignation.

¹¹³ Secretaría de Agricultura y Recursos Hidráulicos, *Cuadros Estadísticos de la Planta de Aserrio por Tipo de Propiedad y el Tipo de Sierra Utilizada en el Estado de Chihuahua*, October 1993.

¹¹⁴ SEMARNAP, Subdelegación de Recursos Naturales, "Inventory of Industries Operating in the State of Chihuahua". Delegación Chihuahua, 1998. This information was requested on November 4, 1998 and was received on February 23, 1999. Memorandum number SRN 08-99. Folio 448.

¹¹⁵ World Bank, *Mexico Resource Conservation and Forest Sector Review*, pp. 48-63

¹¹⁶ In order to have a more complete idea about the ejido and ejido union-based lumber industry, it would be very useful to have an evaluation of these social companies, including their overall efficiency, their financial history, and the history of dividend payments to their members.

¹¹⁷ SEMARNAP, Op. Cit.

¹¹⁸ Hoovers Online, COPAMEX, S.A. de C.V. available online at <http://www.hoovers.com>

¹¹⁹ Copamex. <http://www.uilmac.com.mx/copa.htm>.

¹²⁰ Grupo Chihuahua, under the direction of Sr. Eloy Vallina, also controlled several other companies including Celulosa y Papel Ponderosa, Pondercel, Provedora Industrial de Chihuahua, Taloquimia y Plantaciones Industriales Mexicanas. Local press covered the sale of PISA stock, and was the source of information for a report named, *Seguimiento estadístico de la industria forestal en el Estado de Chihuahua*. Guerrero, Op. Cit.

¹²¹ Cuahtemoc Gonzalez Pacheco, Op Cit. 52.

¹²² Enríquez, Jorge, *Análisis geo-económico del sistema regional de la Sierra Tarahumara* 1988, 173.

¹²³ "Ponderosa rebuilding board machine." (Empaques Ponderosa S.A.) *Pulp & Paper*, May 1996, vol. 70(5) 25

¹²⁴ Market Guide – Business Description Report for Grupo Industrial Durango, available at <http://www.marketguide.com>

¹²⁵ Carlos Acosta Córdoba and Roberto Gallardo Gómez, *Labastida y Gurría seran investigados sobre la venta de PIPSA* and Medina Agustín Vargas, *Fue buena ganga reconoció el presidente de GIDUSA (The president of GIDUSA admitted that it was one sweet deal)*. In *Proceso* magazine, México, D.F. January 16, 2000.

Case Studies: Forestry in the Ejidos of the Sierra Madre

The 1990s witnessed the emergence of several indigenous movements in Chihuahua focused on defending the forest and other natural resources of the Sierra Madre. These movements arose because peasant farmers saw the expropriation initiatives proposed by the State Executive Branch as a threat to their collectively owned land. The ejidos were also weary of the repeated abuses of *cacicazgos*, the increase in illegal logging, and the indifference of governmental institutions in responding to their complaints. In response, the social movements sought to protect ejido members, their natural resources, and their economy from illegal logging, excessive logging, and the mismanagement of ejido funds. The most important social movements in the Sierra Madre emerged in the forest ejidos with the greatest supply of natural resources. Unfortunately, government authorities have taken little action to respond to the indigenous movements, and when the authorities finally investigate the complaints of the social movements they respond only on a case-by-case basis without ever examining the regional effects of forestry or proposing adequate solutions.

This abuse often happens because Western ideas and organizational patterns have been imposed on indigenous people who have a different world-view and different customs than Mexican authorities and other outsiders. Historically speaking, governmental policies have been imposed on them (including schooling). The political,

economic, and cultural exclusion of the farmers in forest ejidos has made them the weakest link in a chain that begins with the multinational corporations, continues on through the federal, state, and local governments, strengthens the *cacicazgo*, and finally ends with the poor, indigenous farmers.

6.1 Administrative Control of Ejidos: the Cycle of Conflict

Led by indigenous leaders, ejido members have recently organized into opposition movements to protest the influence of external administrators, accountants, lumber contractors and even government officials who interfere in ejido affairs. However, those who organize against the *cacicazgo* are commonly harassed, referred to as “rabble-rousers” or “malcontents” and are accused of having evil intentions like creating unemployment in the ejido.

The process of organizing an opposition movement begins with the demand for an audit of the ejido’s administrator or commissary. Private accountants or public officials conduct the audit. Afterwards, indigenous movements bring guilty parties to court. However, defendants often have the ability to post bail, or come up with some other kind of arrangement to avoid going to court because the Public Ministry is often inefficient in putting together the case-file, charging, and prosecuting the responsible party or parties. This delay generally allows for impunity and recurring abuses. When legal action fails, ejido members resort to public pressure.

They organize marches and sit-ins, lobby the State Congress and public institutions, make declarations to mass media, and seek the solidarity of groups such as human rights organizations, farmer and social support groups that may be sympathetic to their cause.

Significant social movements have taken place in the ejidos of Chinatú (1994), Cusárare (1997), Monterde (1997), and Ocoviachi (1998). Each of these movements relates to the administrative control of the ejidos. In some cases, the social movements were successful, resulting in the fining and suspension of individuals involved in the cacicazgo. In the Cusárare Ejido, for example, the caciques were stripped of their ejido rights.¹²⁶ In the San Alonso Ejido (1996), the conflict was solved with the suspension of the ejido's forestry consultant and a fine that was negotiated with government authorities. Other cases, however, have not ended as justly. For instance, in 1998 farmers from the Monterde ejido organized a sit-in demonstration in front of the Federal Attorney General's office in Chihuahua City that was brutally crushed by the Municipal Police of Chihuahua.

In general, the problems identified by these movements remain largely unsolved. Without addressing the underlying problems in the ejidos' administrative structure, the cycle of conflict continues.

6.2 Illegal Resource Extraction

From 1994 until the present, illegal logging has increased at an alarming rate in Chihuahua. In several cases, indigenous people have organized into opposition movements to protest government policies that encourage illegal logging operations on their lands. **Map E** shows the ejidos of the Sierra

Tarahumara where conflicts over natural resources have occurred. Until now, however, government authorities have only take measures that are superficial and inadequate for solving the Sierra's problems. The government needs to enforce the law. Government authorities in SEMARNAP and PROFEPA need to conduct efficient investigations, achieve swift dispensations of justice, and punish those who are guilty of crimes against the environment. Instead, environmental authorities have backed down, renegotiated fines, and removed sanctions that were already imposed (as in the case of the San Alonso Ejido).

During an interview, attorney Agustín Bravo Gaxiola, Director of the Center for Environmental Defense in Northeastern Mexico (CEDANEM), described the problem in terms of environmental justice.¹²⁷ When asked how he would describe the response of environmental authorities to the popular complaints that have been lodged in the state of Chihuahua, Mr. Bravo answered: *“As regards the dispensation of environmental justice in the Sierra Tarahumara, the ideal of a state based on legality is painfully absent. In reference to the attention given to popular complaints, petitions for environmental information, or legal appeals, there is no compliance with legally stipulated response times, there is no legal justification for the application of specific laws, and, instead of adhering to legal procedures, institutional responses are generally arbitrary. Furthermore, cases related to illegal logging are not sent on to the Federal Public Ministry. Perhaps the most serious thing is that citizens have to resort to methods of generating social and international pressure in order to force the environmental authorities to do their job. Even within the discretionary boundaries legally granted to them, they*

[the authorities] should enforce the law do without being obliged to do so."

Map E. Location of Forestry Ejidos with Natural Resource Conflict



Name of Ejido and Municipality

- A Ejido Pino Gordo, Guadalupe y Calvo
- B Ejido Llano Grande, Guadalupe y Calvo
- C Ejido San Alonso, Urique
- D Ejido Churo, Urique
- E Ejido Monterde, Guazapares
- F Ejido Chinatu, Guadalupe y Calvo
- G Ejido Cusarare, Guachochi
- H Ejido Ocoviachi, Guazapares
- I Ejido Cienaga de Guacayvo, Bocoyna
- J Ejido Rocheachi, Guachochi
- K Ejido Ignacio San Arareko, Bocoyna

6.2.1 Case Study: San Alonso Ejido, Municipality of Urique

On September 13, 1996, thirteen members of the San Alonso Ejido in the municipality of Urique filed a popular complaint with PROFEPA against the

intermediaries of the International Paper Company (IPC) for the illegal logging of pine and Tásate Sabino, which is an endangered species. The complaint indicated that trees were being logged outside the designated logging area and were not properly marked. To support their complaint, the thirteen members of

the San Alonso Ejido pointed to timber contracts IPC had made with the company Forestales Asociados S.A. de C.V., from January to September of 1996, which was represented by Refugio Luna García. In January of 1996, the parties involved in the complaint visited San Alonso Ejido in order to see the forest and the region first-hand. The parties included Refugio Luna García; Harry Archer, a representative of International authorities; and other governmental authorities. They also came speak to the e at a business agreement, which was later 1996.¹²

This complaint was a landmark in the because it achieved: (1) the suspension of year suspension of the forestry consultant's license; and (3) a 205,000-peso fine levied against the ejido. After PROFEPA announced the resolution of the popular complaint, IPC representatives accompanied by a group of indigenous farmers and the Ejido Commissary, stood in front of the Governor's Palace for four days. Their aim was to negotiate the 205,000 peso fine and demand that COSYDDHAC,

thirteen ejido members, not be allowed to return to the ejido. The fine was dly reduced to 60,000 pesos, but COSYDDHAC was never barred from

After PROFEPA ruled against the company decided to remove its operations from Chihuahua. Previous to their had expressed interest in creating a series of plantations to harvest regional plan, known as "The Plan for the

Lowlands of the Sierra Tarahumara." Instead, IPC has focused it energies on establishing eucalyptus plan southeastern Mexico.

6.2.2 Case Study: Ciénaga de Guacayvo Ejido, Municipality of Bocoyna

Supported by indigenous authorities, farmers from the Ciénaga de Guacayvo Ejido in the municipality of Bocoyna filed two complaints with PROFEPA and Federal Public Ministry for the illegal logging of pine trees. The first complaint

July of 1999. The farmers demanded that PROFEPA evaluate the ecological to come up with a more accurate estimate and the ejido's economy.

the complaint process. They formed brigades to detain trucks without license laden with pine logs and to catch the illegal loggers red handed. Stemming from these complaints and the

SEMARNAP, PROFEPA, the State Department for Rural Development, and

a series of local forums to find ways to 7,000 logs were confiscated and returned to the custody of the ejido.

However, when the ejido members *detained by the Public Ministry have has been laid on the intellectual authors,*

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guilty parties.

of the Ciénaga de Guacayvo, Retiro, G

protested the government's inaction. It was sent to the State Congress of Chihuahua and stated: "We want our dissatisfaction to go on the record. We also want others to know that a lot of people in the Sierra feel the same way about what we and our forests have to put up with. We are tired of all the illegal logging financed by those who buy and transport stolen wood, and we're disgusted that has been tolerated by PROFEPA, SEMARNAP, The State Judiciary Police, and some of the Public Ministries."¹³⁰

6.2.3 Case Study: Llano Grande Ejido, Municipality of Guadalupe y Calvo

Located in the Municipality of Guadalupe y Calvo, the Llano Grande Ejido lies deep in a region of forests. It is composed of Odami or Tepehuán Indians. Led by Félix Baiza, an indigenous governor, the ejido members filed three popular complaints with the PROFEPA: the first on October 15, 1998, a second on December 4, 1998, and a third in March of 1999.¹³¹

In their initial complaint, ejido members denounced the following events: "*The traditional indigenous authorities and a commission of Odami people organized and went to the place where we heard there were problems. When we got there, we could plainly see that pine trees had been cut down. We began to count the stumps, and none of them bore the stamp of the Ejido's hammer. We were counting the stumps when a guy about twenty-years old by the name of Arturo Trueba Chaparro, came over with an AK-47 assault rifle and asked us, "Just what do you think you are doing?" We answered that we were examining the stumps (...) then he answered that on that land nobody could tell him what to do (...) then he threatened*

*us by saying, "Just the way the pine trees come falling to the ground, so will the elders (referring to us) (...)"*¹³²

The amount of wood lost to illegal loggers in Llano Grande "came to 184 pine trees whose diameter ranges from 35 to 119 cm (14" to 47") with an average volume of 155,608 Doyle feet. In the area called San Miguel, traces of a forest fire were found together with dried up pine trees. This is what illegal loggers leave behind, they often set the trees on fire before cutting them down." In the area known as Los Tarros, "the illegal loggers applied intensive logging procedures in a sloping canyon."¹³³

PROFEPA, however, did little to respond to the ejido's complaints. One year after the first complaint was filed, PROFEPA conducted a field inspection. To date it has not passed judgment on the other complaints, after almost two years have gone by.

6.2.4 Case Study: Rochéachi Ejido: Sand and Gravel Extraction

The extraction of sand and gravel from the streambeds of the Guauichi, Frijolar, and Rochéachi creeks in the Rochéachi Ejido, is a good example of the ejido's inability to protect their natural resources from overuse. Using permits and concessions granted by the National Water Commission (CONAGUA), private individuals who live within the ejido's lands but are not ejido members, have been selling sand and gravel from the creek beds.

On September 4, 1998, two Rarámuri farmers filed a complaint with PROFEPA regarding the extraction of sand from the Guaguichi and Frijolar Creeks. They cited the impact this was having on the creek's fauna, the erosion it was causing in the agricultural plots that border the creek, and the loss of water in wells and

he place of the fish,” but that now there are no more fish because the water has gone away. There

weaves through a streambed that has been destroyed by backhoes.

After this complaint was filed, six more followed in t and December 1998, and later in March, July and August of 1999. Because both

these complaints, there was broad citizen participation in the movement to solve

the nuns and other community authorities, local women created the Rochéachi Creek Defense Committee, which represented the community’s struggle to defend the creek before the governmental authorities.

In 1998, government response to ejido complaints resemb ping-delegation of Chihuahua declared that this problem was out of their jurisdiction and

that this was clearly a problem for PROFEPA. Finally a conversation with

A representatives established that PROFEPA delegation of

case. In August and September the

information regarding the case.

bed and flowed,

press bulletins, and presented the case in the North American Forum held in Creel

1999.¹³⁴

forum to send a letter about the

Julia Carabias Lilo, Director of SEMARNAP. The defense committee

that was attended by more than 300 pe

areas. Some people came from Chihuahua City to show their support.

After a year of activism in support of Director of Water from CONAGUA drew up a

community residents agreed to sign. It states “*CONAGUA is committed to completely suspending sand and gravel extraction from the Rochéachi, Frijolar, and Guaguichi Creeks for an indefinite*”¹³⁵

suspended the sand and gravel

decision to indefinitely suspend all

requests from the community to revoke the current concession.”¹³⁶ SEMARNAP is “*currently elaborating a project restore Rochéachi Creek.*”¹³⁷

Despite the rulings of the authorities,

COSYDDHAC that the same person was extracting sand again from Frijolar Creek.

laint with PROFEPA. As they say in Chihuahua, “va de nuez” or “here we go

6.3 Intensified Pine Tree Logging: A Questionable Legality

One factor contributing to the growth of logging in Chihuahua and Mexico is the manner in which SEMARNAP considers the impacts of logging on an ecosystem. Each forestry project receives approval based on the submission of

Forest Management Plans (FMPs).¹³⁸ Currently, SEMARNAP examines forestry projects on a case-by-case basis allowing loggers to argue that SEMARNAP should grant additional permits because they have not reached the previous annual harvest limits. This approach, however, ignores the cumulative effects these projects are having on the Sierra forests. Once the permit is granted, the FMP is the final word regarding what should or should not be done in the forest, especially in logging areas. SEMARNAP therefore needs to look at logging projects on a more regional basis. The following case studies examine intensified pine tree logging in the Sierra Madre.

6.3.1 Case Study: San Alonso Ejido, Municipality of Urique

On June 7, 1996, the Ejido Assembly of San Alonso in the municipality of Urique approved a contract to sell 75% of the secondary materials from the 1995-96 harvests to the International Paper Company. This harvest accounted for a total of 6,890 cubic meters RTA and was the last of six harvests approved under the project's original FMP.¹³⁹ SEMARNAP granted a new permit, which added 7,420 cubic meters RTA of oak for the harvest. This more than doubled to approve the new FMP SEMARNAP used obsolete aerial photographs as a harvest limits. complaint filed by San Alonso farmers in the other sanctions that were imposed set an important precedent. However, it is and the pace and intensity of logging has

not change harvest limits for the past four years in San Alonso Ejido have gone as high as

Municipality of Urique

The Churo Ejido in the municipality of Urique has a total surface hectares, 1,605 of which are currently in litigation with the San Alonso Ejido. The generous forestry permit which was contested by the San Alonso Ejido. In February 2000, the Rarámuri Governors, supported by ejido members, sent a letter to the SEMARNAP delegate urging him to *“suspend the lumber contract being logged without a stamp, and because the contract is crooked.”* They also requested that, *“the Commissary and rsight Committee both be audited for the total number of board feet that they have cut.*

The current FMP contemplates five annual harvests from 1998 to 2002 with - year logging cycles. Several concerns raised by the Rarámuri Governors regarding the approval of the FMP. These concerns included the fact farmers eight months after it was finished without offering any explanations for the ined a commercial area of 3,417 hectares (8443 acres) and a acres), but did not make any mention of reforestation or restoration of these areas; finding forest areas of commercial value; aside for agriculture, meaning the FMP establishes the logging area where there

extreme. The logging areas lie mainly in canyon areas, which are susceptible to erosion and runoff, while the area set aside for conservation is full of shrubs and small oak trees. In other words, what is being conserved is an area that is already biologically degenerated. Other concerns focused on the FMP's section on biodiversity, which provides no information on the integral management of the natural resources that are specific to that Ejido's ecosystem. Rather, the information was simply copied from other sources. Regarding the fact that the study is not based on field work, in September 1999 the ejido members and Raramuri governors stated in their letter: *"as soon as the first trees are marked, we'll know whether the study says that more trees are to be logged than the forest can withstand, or whether it is correct."* As far as the cutting cycles are concerned they said, *"Fifteen years is not long enough for the forest to recover, it's not long enough for a tree to grow, which is why one has to wait at least twenty years."*¹⁴⁰

6.3.3 Case Study: Llano Grande Ejido, Municipality of Guadalupe y Calvo

The Llano Grande Ejido in the municipality of Guadalupe y Calvo received a forestry permit negotiated between the company representative of Duraplay de Parral and the ejido president. Their contract was approved in an Assembly meeting in which the ejido members were not allowed to speak. In this case, the ejido president and forestry consultant acted as cacicazgos and acted against the will of the community.

The contract, lasting from 1998 to 1999, was for as many standing pine trees as the limit allows, which effectively lets the company take as much wood as it wants to. The ejido has a total land

surface of 15,736 hectares and the financial report that the company gave to the ejido states "the company received from the ejido the quantity of 1,667,458 Doyle feet of wood."¹⁴¹

In 1999, a group of forty ejido members complained about the intensive logging that was being carried out in a region known as la Ciénaga, because it is the source for the streams that supply water to the health center and the school. The farmers had made an agreement with the company to protect the area by exchanging its wood for wood in another area. However, the Ejido President and the forestry consultant did not respect the agreement and proceeded to cut down trees larger than 30 cm. (12") in diameter. The farmers also requested that the company be fined for not cleaning the forest where it had logged. After a complaint was filed with Maestra Julia Carabia Lilo, Director of SEMARNAP, government officials made a visit to the area in question. There, the ejido's forestry consultant showed that based on the FMP the logging of the area in question did not affect the recharging of the springs, and therefore the logging of this area was not in violation of the regulations. He further argued that, because the recharging area for these springs belonged to the Reforma Ejido, la Ciénaga was located outside the zone covered by the original FMP.

6.3.4 Case Study: Pino Gordo Ejido, Municipality of Guadalupe y Calvo

The Pino Gordo Ejido in the municipality of Guadalupe y Calvo lies deep in the Southern Sierra Madre where there are still about 6,000 hectares (14,826 acres) of old-growth forest. Pino Gordo is comprised of Tarahumares who are considered "gentiles" or people who have rejected Catholic baptism.¹⁴² Besides

having agrarian problems because many of the farmers' agrarian rights have not been recognized, Pino Gordo has land ownership conflicts with the Colorada de los Chávez Ejido, which is inhabited by mestizos, and the Chinatú Ejido, with an indigenous and mestizo population.

The residents of the Pino Gordo Ejido filed an intensive logging complaint referring to the area under dispute, which is claimed by both Pino Gordo and Colorada de los Chávez. The intensive logging affected about 11,000 pine trees, and the Pino Gordo farmers demanded that the forestry permit of Colorada de los Chávez be revoked, that those found guilty of the intensive logging be punished, and that the authorities who approved that permit be sanctioned.

PROFEPA sent personnel from the Chihuahua delegation, and from the main office in Mexico City to perform an audit in seven logging areas belonging to Colorada de los Chávez. The audit uncovered the following irregularities:

- 1) "Forest clean-up measures are unsatisfactory,
- 2) There are areas that have been cleared and burned where forest producers are not actually working,
- 3) Faulty road construction is causing soil erosion and difficult access,
- 4) Only pine trees were logged, leaving behind oaks and other trees,
- 5) Only primary pine products were exploited,
- 6) Secondary forest products from the pine trees were not removed,
- 7) 20 hectares of sector 201 were logged without a permit from SEMARNAP,
- 8) Only pine trees larger than 30 cm. (12") were cut down, and, contrary to the authorized FMP, smaller categories went untouched,
- 9) Trees belonging to the *Pinus spp.* species were logged along the road protection zone,
- 10) Primitive roads made for extraction purposes with no anti-erosion measures were found with lengths totaling 2,800

meters by 3 meters wide. A total of 8,400 square meters of unauthorized soil use change had occurred,

- 11) The inspection found 64 fresh, pine tree stumps with diameters ranging from 40 to 70 cm. (16" to 28"), for a total of 128,200 cubic meters RTA,
- 12) It was observed that defective trees were not marked for logging purposes,
- 13) The stream protection corridor was not respected because trees within that area had been marked for logging,
- 14) In all seven zones, the FMP had been violated, because fewer trees had been left behind than proposed by the FMP."¹⁴³

Because of the irregularities mentioned in the forest audit, PROFEPA concluded that natural resource exploitation permits in Colorada de los Chávez must be suspended.

6.4 Conclusions

Social movements arise time and again in Chihuahua to protest the government's inaction and to propose measures that may solve the conflicts. Ejidos have filed formal complaints against illegal logging operations, staged protests, met with government officials, etc. Sadly, their voices oftentimes fall on deaf ears. Even in successful cases, where the cacicazgo structure may be temporarily debilitated, (as is the case in the Cusárare Ejido)¹⁴⁴ other individuals step into the power vacuums created by the cacicazgo's disappearance. Enormous sums of money are at stake in the process, awakening the ambitions of outsiders who care little about the health of the forest, and even less about the well being of indigenous cultures.

The response given by SEMARNAP authorities to the problems facing forest ejidos has been inadequate. It is critical to make the administration of environmental justice more efficient in order to combat illegal logging and protect forest

xico. (CEDANEM) San Felipe, Chihuahua, México, Fall 1999, COSYDDHAC Archives

¹²⁸ COSYDDHAC Archives: *El Plan forestal de manejo sustentable para San Alonso*, which includes objectives and basic principles and the *Nota Informativa* prepared on May 15, 1996.

- ¹²⁹ COSYDDHAC Archives, Ciénega de Guacayvo. Memorandum addressed to: Comisión de Ecología del Congreso del Estado. Chihuahua, Chih. August 7, 1999.
- ¹³⁰ Ciénega de Guacayvo Memorandum. Op. Cit.
- ¹³¹ Centro de Derecho Ambiental del Noreste de México (CEDANEM). From Record of Environmental Complaints filed in collaboration with COSYDDHAC. 1999.
- ¹³² COSYDDHAC Archives, taken from the text of a complaint that was filed on November 11, 1998.
- ¹³³ Workshop: *How to Document Illegal Logging, given at Llano Grande Ejido, Municipio Guadalupe y Calvo*. Published by Consultoría Técnica Comunitaria A.C. (CONTEC), March 1999.
- ¹³⁴ The Rural Coalition is a tri-national organization of producers and farmworkers. It held its last assembly in Creel, Chihuahua from September 14 to 19, 1999. 1411 K Street NW Suite 901 Washington, D.C. 20005 tel. 202/628-7160. E mail: Ruralco@ruralco.org
- ¹³⁵ Comisión Nacional del Agua. Gerencia Estatal de Chihuahua. (State Representation of National Water Commission) Document drawn up at the Rochéachi Ejido, Municipality of Guachochi on October 13, 1999.
- ¹³⁶ PROFEPA. Memorandum Number B22PROFEPPA.07.C/ Chihuahua, January 19, 2000
- ¹³⁷ PROFEPA Op. Cit.
- ¹³⁸ Ley Forestal. (Forestry Law) Chapter II. page 54.
- ¹³⁹ Brochure: *Information about PRODEFOR Projects and the Forest Management Program*. No. 13 of the Collection Aprendiendo Juntos (Learning Together). Chihuahua. Chih. September 1999. RTA is an abbreviation for “rollo total árbol”, and is one of the standard measurements used in Mexico.
- ¹⁴⁰ COSYDDHAC Archives. Churo Ejido. Memorandum requesting the suspension of forestry activity and an audit of the Ejido Commissary. Chihuahua, Chih. February 7, 2000.
- ¹⁴¹ COSYDDHAC Archives. Llano Grande Ejido. Receipt given to COSYDDHAC for the Assembly on Tuesday November 16, 1999.
- ¹⁴² COSYDDHAC Archives. Pino Gordo, 1999. Some of this information was provided by Sierra Madre Alliance 11650 Sioux Dr. CH44119. El Paso Tx. 79925 E-mail: <mailto:sierrama@infosel.net.mx>.
- ¹⁴³ PROFEPA. Report on the Technical Forestry Audit carried out in the community of Colorada de los Chávez, Municipio de Guadalupe y Calvo, Chihuahua. Septiembre 1999. This is a summary of the report's findings at the Pino Gordo Ejido (an area under litigation with the Colorada de los Chavez community). June 1, 1999.
- ¹⁴⁴ We should add the words that a Rarámuri man said to us one day, “*the plants that don't like the sun are no longer with us.*” PROFECTAR workshop in Sisoguichi, Bocoyna in March, 1998.
- ¹⁴⁵ For more see Margot Heras. Nawésari: Espacio de resistencia. (el caso de Cusarare) Revista: MURKA. Bimestral. Año II, Núm. 2. Instituto Nacional Indigenista. Chihuahua, December 1999.
- ¹⁴⁶ *Ley Forestal y su Reglamento*. Published in the Diario Oficial on May 20, 1997. Chapter V. Articles. 20, 21 and 22.

Luxury Tourism in the Sierra Madre

Until recently, forestry has been the main economic activity in the Sierra Madre. However, during the period from 1992-1998, tourism became another economic priority. Today, the Copper Canyon Tourism Project, supported by national and international banks, is one of Chihuahua's grand projects for encouraging development in the Sierra Madre.¹⁴⁷

Tourism, however, has generated serious problems for local inhabitants. Indigenous people are being pushed aside to allow private investors to build large hotels. Some hotels are built to provide five-star accommodations in an area where resources, especially water and timber, are scarce. Some proposals recommend diverting water reserves from indigenous communities to supply these hotels with water. Other hotels are built without environmental impact studies or studies to determine how to transport water.

The management of the tourism industry in the Sierra Madre is deficient and at times conflicts with the interests of the region's indigenous communities. The only national parks declared in the Sierra Madre are Basaseachi Falls, and Majalca Mountains. The Papigochi and Tutuaca River basins have been declared protected areas.¹⁴⁸ It seems that only Majalca has a program that is run by residents living in the area. Other tourism projects are managed by outsiders who take profits generated in the Sierra to buy goods and services outside the region.

7.1 Tourism Mega-projects and Rural Movements

The main tourism project in Chihuahua is the Copper Canyon Tourism

Project. The Copper Canyon covers a large area of the northern Sierra Tarahumara. However, tourist activities are normally centered around the town of Creel. Tourist activity has brought many resources and recognition to the northern Sierra, but it has also brought its share of problems. These problems incited indigenous communities to rise in defense of their land, most notably in the Ejido of Creel between 1996 and 1998, and the Ejido of San Ignacio Arereko between 1992 and 1996.

After a difficult negotiation process, farmers living in Creel accepted a plan to zone the ejido's lands for tourism. They received compensation for their land, but most of the farmers were not satisfied with the amount they received. As a result of the zoning, Creel's growth is rapidly swallowing up former ejido lands. Zoning helped spur the real estate business around Creel. Now, its chaotic urban development has created numerous problems for the town's residents. Foremost on the list is the scarcity of water, a detail that government officials seem to have overlooked. Current tourism proposals for the Creel Ejido lack environmental impact studies for water consumption. Another problem is the city's handling of wastes. Currently, Creel channels raw sewage into the river, and the amount of solid municipal waste has outstripped the town's ability to deal with it. Furthermore, there is no way to adequately confine the garbage, nor are there any proposed projects to recycle it.

Another problem within Creel is the large amount of industrial waste generated by the Maquiladora de Madera, S.A. de C.V. which manufactures railroad ties and applies creosote to preserve the ties. The company allows the creosote-

residue to flow freely out the chimney together with incinerator ashes. The company applies another toxic chemical for wood treatment and stores its sawdust out in the open allowing the chemical to leach into the river.

In response to these problems, indigenous communities near Creel organized social movements to defend their land from plans to expand Creel's urban center. Against the community's wishes, state officials proposed surveying urban lots to determine "*public domain*" and to zone areas for tourism.

However, the ejido members of San Ignacio Arareko mobilized and managed to prevent zoning initiatives of their ejido land. As a result, indigenous people temporarily blocked the spread of the tourism industry in San Ignacio Arareko, causing the administration of San Ignacio Arareko's Tourism Commission to search for new models of tourism development.

The current Tourism Commission has adopted a controversial model. This unfortunate situation has its origin in a "sordid war" waged by factions within the ejido. On one side, public and private institutions that support the current Ejido Administration are fighting against indigenous organizers of the tourism project and an NGO, Alternativas de Capacitación y Desarrollo Comunitario A.C. (ALCADECO) that have devised their own tourism development model.¹⁴⁹ The conflict has promoted a privatized tourism model, which relies on large investors and advisors who live outside the community. The only role left to the Rarámuri is to form part of an exotic backdrop made of folklore and imposing landscapes.

7.2 The Case of San Alonso Ejido

The San Alonso Ejido exemplifies the tragic tendency in the Sierra

Tarahumara to shift to "ecotourism" to solve the problems of the poor communities and exploited environment. Throughout Chihuahua, partnerships between ejido members and private industry have been promoted as part of the tourism project. These models function more like cooperatives than *sociedades anónimas*, and include Societies for Social Solidarity, Rural Production Societies, and Rural Societies of Limited Interest. In the San Alonso Ejido, a group of ejido members financially supported by the State Tourism Office formed a Rural Production Society to develop a tourism project. The Society requested that the ejido donate 18 square kilometers of land so they could begin building the infrastructure necessary for their tourism project. To date, the Ejido Assembly has not approved the transaction. Despite the lack of ejido approval the project moved ahead with private finance and hostels are being built on ejido land. If the land were donated, it would become property of the tourism project association, and would be removed from the ejido. On the Guitayvo Mesa, forest resources are all but used up. The indigenous majority has been disenfranchised and, in their name, negotiations are being carried out that will benefit only a small group. As they say in Chihuahua, the social phenomenon known as the *Sombra del caudillo* is alive and well in this ejido.¹⁵⁰

7.3 Conclusion

If properly implemented tourism could represent an additional source of income for the local communities of the Sierra Tarahumara. Unfortunately, the projects promoted in the Sierra thus far have led to conflicts and overexploitation of natural resources. Indigenous communities' approval and

involvement is necessary to ensure that tourism will become a prosperous economic activity in the region.

¹⁴⁷ *Plan Barrancas del Cobre. Estrategia de desarrollo turístico.* (Copper Canyon Plan. Strategy for the Development of Tourism.) Subdirección de Planeación, Gobierno del Estado de Chihuahua, SECTUR, FONATUR. Chihuahua, November 1995.

¹⁴⁸ Mexican Government, *Aprovechamiento y Conservación de los Bosques: Plan Nacional De Desarrollo, 1989-1995*, pp. 239-141 and Texas Center for Policy Studies, *Biodiversity Protection in the Texas Mexico Border Region*, September 1993, p. 16

¹⁴⁹ Alternativas de Capacitación y Desarrollo Comunitario A.C. (ALCADECO) Calle Chapultepec No. 257-B Apdo Postal 46 C.P. 33200 Creel, Chihuahua. Tel y Fax: (145) 600 78

¹⁵⁰ The expression, *la sombra del caudillo* (*the shadow of the leader*), refers to the title of a novel by the Chihuahuan writer, Martín Luis Guzmán, published in 1929. This novel tells the tale of the bloody power struggles that followed the Mexican Revolution, and the way power was consolidated at all cost.

Chapter 8

Conclusions

We hope the publishing of this report will help highlight and spur resolution of some of the problems of the ejidatorios living in the Sierra Madre, without whose trust and support many of the cases mentioned here would not have come to public attention. To complete the report, we present a list of twelve conclusions and recommendations that may help to solve some of the problems of the region's indigenous communities.

1. The Western Sierra Madre of Chihuahua is more than just a source of raw material for forestry, mining, and tourism projects. It is one of the world's unique cultural regions and it provides water, oxygen, biomass, and biodiversity, vital for both local residents and for people who live in bordering states.

The greatest challenge facing the governments and societies that benefit from this region's natural resources is to implement public policies that will strike a healthy balance between production and conservation. If this is not done, the consequences will be ecological devastation and social disintegration. It is absolutely vital to declare the few remaining stands of old-growth forest protected areas because they are the last remains of the Sierra Madre's biodiversity. These forests are located in the Ejidos of Pino Gordo, Colorada de la Virgen, Llano Grande and Mala Noche in the Municipality of Guadalupe y Calvo. We ask SEMARNAP and the State Government to intervene and suspend all logging in these ejidos until the minimal conditions for sustainable forestry are established.

2. The security of land ownership is vital for the stability of the forest ejidos. For the implementation of PROCEDE in the ejidos of Guadalupe y Calvo, where the program has yet to be carried out, it is imperative that authorities accept the farmers who live on the land as legitimate owners and grant them full ejido rights. To only accept the names that appear on the presidential decree would be a mistake, as many of those named have been living outside the community for more than 10 years. This is happening in Pino Gordo and in Colorada de la Virgen, and is the source of great social conflict.

We urge the Agrarian Tribunal to uphold the principles defined in Covenant 169 of the International Organization of Labor, the Fourth Article of the Constitution and Section VII of Agrarian Law.^{151, 152, 153}

3. History has proven that during the past century, natural resources were not subject to any real controls, despite legislation in turn. In practice, forestry is subject to the criteria of the market, and the Law is merely molded to fit changing economic interests. Instead of paying lip service to law enforcement and sustainability, legislators and government officials must act to protect the nation's resources. True economic development must balance ecology, productivity, well-being and human rights so that natural resources will not be used up. Without this balance, sustainable development quite simply does not exist.

4. To move closer to the ideal of sustainability, people in charge of policy design will have to be sufficiently ethical,

educated, and willing to handle and produce information in a more professional manner. They will have to plan and adapt training systems and facilitate the flow of information from farmers to technicians and vice versa, with the goal of reforming the educational system so that it reflects the needs and characteristics of rural development in the Sierra Tarahumara.

5. The impact of NAFTA on the forestry sector has been negative because it has encouraged uncontrolled resource extraction with no guarantee for ecological recovery. Many thought NAFTA would bring transferal of technology to Mexico's rural sector. However, companies investing in the Sierra Madre are over-harvesting the resource and driving it to the brink of collapse. Furthermore, access to information derived from satellite imaging and systems of interpretative geography have not been used by the government to design a coherent policy of sustainable forest management. This same information is not made available to the NGOs that work in the Sierra, and much less to the ejidos.

6. International organizations need to take an interest in the Sierra Madre's natural resources. International corporations are getting rich off of lumber and paper, without providing adequate benefits to the region's inhabitants.¹⁵⁴ No further logging permits should be granted until sound planning exists, because the lack of planning is largely responsible for the anarchy and abuse that is running rampant in the Sierra. If logging in the Sierra continues at its present rate, with no regard for bio-diversity or conservation, the economic outlook for future generations will be bleak.

7. Given the vast discrepancies in the environmental studies carried out in the Sierra Madre, a thorough analysis of the environmental impacts of logging on the Sierra's ecosystems must be undertaken. We need current, reliable information in order to determine the immediate future of the logging industry. The results of this study must be at the disposal of all social and non-governmental organizations that request them.

8. In order to determine the true effectiveness of the Forest Management Plans as an instrument to enforce environmental regulations, it is absolutely necessary to carry out an environmental audit of all 1998 and 1999 FMPs. This audit must take into account the demarcation of logging areas as well as conservation and restoration areas and must also be made available to the residents of the Sierra and the social and non-governmental organizations that request them.

9. Planning mechanisms must become the priority for the forestry sector. The government should encourage the ejidos to participate in the chain of production. To support the ejidos, international criteria for the certification of sustainable wood production must move forward.¹⁵⁵ This could stimulate the internal re-organization of forest ejidos around concepts of sustainability.

The administrative re-organization of the ejido should also move forward in order to lay the foundation for more sustainable forestry practices. Ejido members and their children must have access to greater professional training. They should fill the following positions and be appointed by the assembly only after having received the necessary training. Relevant positions might include: 1). One Administrator or Chief

of Finances and one aide, 2). Supervisory Commission comprised of between three and six ejido members, 3). Field Chief and Aides, 4. Lumber Clerk and Aides.¹⁵⁶

10. There are several areas where the government needs to improve regulatory enforcement to better address the concerns of the Sierra Madre's indigenous communities.

- One area of concern is the close association of government authorities in SEMARNAP and PROFEPA with the lumber industry should not give rise to a one-sided forest policy that only favors the lumber industry. Unfortunately, history has proven that it has. To improve its institutional credibility in Chihuahua, PROFEPA should remove from its roster all forest engineers who have direct ties with the lumber industry. They should also swiftly sanction those companies found guilty of environmental violations.
- The Public Ministries both at the local and the federal level should be strengthened so that they are more capable of carrying out investigations, arresting those responsible for environmental violations, and punishing them as dictated by law. The State Government should open the State Forest Council to the broad, democratic participation of public interest organizations with the right to vote on forest policies in order to balance the viewpoints and ensure that the decision-making process reflects an integral vision of the problems of the forest.

- PROFEPA should respond to our request for information regarding the 411 complaints filed at that office since 1996. They should tell us how many have been concluded, how many fines were levied, how much money was paid in fines, whether those responsible committed further violations, and explain the restorative measures taken in each case.
- It is absolutely essential that environmental justice be served, and that those found guilty of crimes be sentenced. The dismal lack of enforcement is responsible for the repeated crimes against the forest and the land in the state of Chihuahua. For this reason we emphasize the need to penalize purveyors of illegal logging that has occurred in Ciénaga de Guacayvo, municipality of Bocoyna; Llano Grande and Pino Gordo in the municipality of Guadalupe y Calvo; El Consuelo in the municipality of Carichí; and El Churo in the municipality of Urique. The extraction of sand and gravel in Rochéachi, municipality of Guachochi must also be resolved. Those who purchase illegally logged wood must also be investigated and penalized. Until there is justice, the credibility of governmental institutions will remain doubtful, impunity will grow, and the forests of the Sierra Madre will continue to disappear.

11. In addition to requiring wood documentation, the only way to halt illegal logging is through industrial planning. The establishment of sawmills, storage areas, and other transformational industries must be regulated so that it will

be tied to the productive capacity of the forest instead of the forest being tied to the productive capacity of industry.

12. Following the 1993 suspension of the forestry loan project between the World Bank and the Mexican Government, the Bank changed its focus and set up a new project in Oaxaca, with a focus on sustainable forest management practices. Perhaps international financial institutions could become interested in supporting forest ejidos in the Sierra Tarahumara that

strictly adhere to sustainable forestry practices.

We also feel that the resources in PRODEFOR and PRODEPLAN should be applied directly to strengthening sustainable forestry practices. If this does not happen, these resources will do nothing to improve administrative structures, the well being of ejido members, or the health of the forest. They will only fill the pockets of a few people, as has occurred with many other projects.

¹⁵¹ Mexico signed Convention 169 of the International Labor Organization in 1989. It defines territorial rights, and refers to the right to autonomy, self-government, and culture.

¹⁵² Article 4 of the Constitution recognizes the customs and traditions of Mexico's Indigenous groups.

¹⁵³ Section VII of Agrarian Law enumerates the principals of protection that the Law will give to indigenous lands.

¹⁵⁴ Workshop on Forest Accounting and Contracting given by Consultoría Técnica Comunitaria, A.C. (CONTEC) at the Rocoroybo Ejido in February 2000. In the Ejido of Rocoroyvo, which has an annual productive potential of 19,000 cubic meters, two mestizo ejido members (father and son) were putting pressure on the Commissary to sign a contract for 1 million Doyle feet of wood with the Duraplay Company. "There's no time," they said, "we've got to sign the contract." At a forest accounting workshop that we gave at that ejido, those who participated said, "rushing to sign a contract doesn't favor the forest or the ejido members, it only favors the truck drivers and the company because they get a cheaper contract. We can wait. We still have food to eat. Though it's not much, we won't go hungry

¹⁵⁵ Consejo Mundial de Manejo Forestal, Ing. Francisco Chapela. Apartado Postal 24, Col. Reforma, 65950, Oaxaca, México.

¹⁵⁶ Asesoría Técnica a Comunidades Oaxaqueñas (ASETECO). Lic. Rodolfo López. Eucaliptos 320, Col. Reforma, Oaxaca. Tel. (951) 31730. Over the past 16 years, ASETECO has carried out a training program with the administrators of communal companies in Oaxaca. Through this program, the technicians and administrators have been able to receive professional training and increase their administrative efficiency. The function of the Supervisory Commission in the administrative scheme of forest communities in Oaxaca and Michoacán is to permanently audit the financial sector of the company and the commissary of communal wealth, and to report to the Assembly on financial and resource management. This training is the first step toward changing the internal structure of the ejido. This will enable the ejido to become a lumber company capable of managing both its own financial and natural resources. Under this organizational scheme, positions last for one year, which is why each year training sessions begin one month before the administrators leave their position and the new people take over. This allows for job rotation and increased training. Viaje a Oaxaca, Parte II, Viaje a la Sierra Sur. Colección: Aprendiendo Juntos (Learning Together), No. 2. Published by CONTEC, Chihuahua, Chihuahua, January 18, 1998.



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