

# Forests for the Future: The Great Challenge

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Abstract: Mexico is a nation endowed with a rich and wide diversity of forest ecosystems. That natural resource however, has been under an intense process of degradation and destruction along the time. Among the main causes are: heavy logging that intensified by the end of the XIX century and the second decade of XX century, ineffective forest legislation and policies, and severe pressure to forests by local rural people as means of survival. At present time, damage to the ecosystems has continued as a result of the increasing demand for forest products caused mainly by population growth. The number of rural population living in poverty has also increased and so the negative impact on forests. Added to these circumstances are damage caused by fires, pests and diseases on the forests. The estimated rate of deforestation is 150,000 hectares per year. Of no minor importance is the effect of climate change on the resource. The current tendency of the Mexican forests destruction has to be stopped. A detailed revision of forest policies and legislation applied, along with the public administration failure for decades is urgent. Definition of demands of natural forests and forest plantations for the future is deemed highly important. Strategies and actions for a long term plan for a sustainable use and conservation of the Mexican forest ecosystems are suggested.

Key words: Mexican forest ecosystems, forest conservation, forest policies, forest legislation

# 1. The Past: Heritage of Deterioration and Destruction

Till the first two decades of the XX century, a major technical, political, legal and administrative gap, was prevailing in the Mexican forest sector. This was caused by the absence of legislation, of a public forest policy and the lack of professionals in forestry and natural resources.

As a result, logging was intense, lacking at all of control and normativity. This chaotic situation led to the promulgation of the first Forest Law in 1926.

The content of the law was basically conservationist. Subsequent to this pioneer legislation, other seven forest laws have been enacted. Table 1 outlines the decree dates of those laws and the presidents that enacted them.

The forest laws reflected the vision of the rulers and that of the society along the historic moment of their

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Forest law	Promulgation	Validity	Presidential
	date	period	period
First	1926	17	Plutarco Elías
			Calles
Second	1943	5	Manuel Ávila
			Camacho
Third	1948. Reformed in 1951 12	10	Miguel Alemán
		12	Valdez
Fourth	1960. Reformed in 1971	26	Adolfo López
			Mateos
			Luis Echeverría
			Álvarez
Fifth	1986	6	Miguel De la
			Madrid H.
Sixth	1992. Reformed	11	Carlos Salinas
	in 1997		de Gortari.
Seventh	2003	14	Vicente Fox
			Quezada
Eighth	2018	Valid	Enrique Peña
			Nieto

Table 1Forest laws enacted in Mexico, 1926-2018.

promulgation. All of them reflected as well, the purpose to preserve, manage and harvest the Mexican ecosystems according to the best mechanisms and techniques available. This purpose, however, was only partially achieved. Several factors and circumstances have been responsible of a progressive deterioration of

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the natural resource. The most important are commented next.

#### 1.1 Social and Economic Factors

Along the time, forests have been home of numerous ethnic groups and rural societies. They have harvested wood and other raw materials from de forests for their survival. In rural areas, wood is the basic fuel available. It is also of great value for rural construction and for making a variety of household items. In addition, significant areas covered by forests, along the time, have been converted into cropland or cattle raising [9].

Other factors that have impacted on forest destruction are: over harvesting by large forest concessions mainly in the period 1940-1970, illegal logging by organized groups, and conflicts among rural communities disputing the use of the natural resource.

### 1.2 Institutional, Political and Legal Factors

For years, inefficient government systems have implemented inadequate policies and legislation. They have impacted on the conservation and adequate management of the forests. The most relevant example of wrong forest policies was the promulgation for the period 1940-1970, of forestry bans to cancel wood harvesting over most of the nation's forests. The result over the years was a general forest clearance for crop land conversion over most of the country.

Corruption and poor forest service performance along decades, has promoted overexploitations in most of the forests. High level of bureaucracy in the forest administration has long prevailed, promoting illegal logging.

### 1.3 Natural Factors

The characteristic dynamics of nature brings associated, natural agents that invariably impact on forest ecosystems. A notable case are climatic disturbances with high destructive impacts on forest ecosystems. An example was hurricane Gilbert, which in 1988 caused a significant damage to the tropical forests of the Quintana Roo state. Other important natural phenomena, like forest fires, pests and diseases have also highly impacted on Mexican forests. The majority of forest fires, are caused by rural people, as a tool to convert forests into agricultural lands. At present, the scourge of climatic change has been increasing its damage to forests and natural resources. Forest fires have increased in number with greatest damage in recent years. The Mexican ministry of the Environment and Natural Resources reported an average of 7,090 forest fires/year for the period 2015-2019 [8]. The state of Mexico, which surrounds Mexico City, concentrates the major part of the fires.

As a result of the aforementioned factors, deforestation and forest fragmentation has been increasing in Mexican forests. The rate of deforestation for the nation has been estimated in the range of 150,000-200,000 hectares per year.

# 2. The Present: Increasing Degradation of the Forests

#### 2.1 The Economic Perspective

Due to growing population and the diversification on the use of wood and forest products, their demand has been increasing. In 2012, the Apparent Consumption of Forest Products was 17.9 millions of cubic meters of round wood, the figure for 2016, increased to 23.4 millions [7].

Since the nationwide annual wood harvest has not been able to satisfy the growing demand for wood products, imports have been increasing. Chile, U.S.A. and Canada are the source of imports. The value of the deficit of forest products international trade balance in 2016, was US \$5 928 millions. It is expected this figure will keep growing for the coming years. Another impact of the growing demand for wood, is the increase of illegal wood harvest. In 2009, the illegal wood harvest was estimated in 7 million round wood cubic meters [1].

# 2.2 The Environmental Perspective

The erratic growth of urban centers, the expansion of the industrial activity and the conversion of natural landscapes into lands for agriculture, cattle raising and mining are leading to profound environmental problems. This is reflected as following:

Deforestation. Through time, Mexico has been placed among countries with the largest rate of deforestation. FAO [3] highlights Brazil, Mexico, Venezuela and Bolivia as the Latin American countries with the largest rates of deforestation. The official figure for 2000-2010 period is 155,000 hectares/year. This amounts to 0.2% of the total forestry area [6].

### 2.1.1 Biodiversity

Numerous animal and plant species have been reduced in their populations. Degradation and loss of their habitats is the main cause of biodiversity loss [2]. Habitat loss, poaching and illegal trade, climate change and ocean acidification remain major threats to Mexican species. In many cases, the Mexican government has failed to enforce existing laws to protect endangered species [5].

# 2.1.2 Pollution

Forests and their components (air, water, soil, vegetation, and wildlife) are being increasingly affected by pollution. The problem is of major concern in forests located near large cities, as Mexico City, Guadalajara and Monterrey. Fenn et al. [4] reported a dramatic and severe decline at the Desierto de los Leones forest, a park located at south Mexico City, caused by air pollutants generated in the urban area.

### 2.2 The Social Perspective

Around 61 percent of the area covered by forests is property of communities in the form of collective land ownerships under the name of ejidos or comunidades -indigenous land holdings [10]. This circumstance has created problems that affect the natural resource. The most important are: agrarian litigations resulting from undefined property boundaries, illegal logging by members of the community, overexploitation due to logging concessions by the communities.

# **3.** The Challenge for the Future: Forests for What and For Who?

The uncertainty about the future permanence of the forests arises basic concerns. The main one is: What total area and type of forests are needed to satisfy future generation's demands? From this, some basic definitions are urgently needed: With a view to the future, from the total forest land presently available, what extension should be preserved? More precisely, what forest land area should be preserved for: (a) productive commercial purposes (wood, resin, dendroenergy, etc.); (b) ecoystem production (water, carbon sequestration, biodiversity, climate, air purifier, etc.) and (c) recreational purposes?

At present time, forest plantation has been of increasing importance in several nations. This arises the question of how forest plantations should supplement the future role of the natural forests. What land area of forest plantations and what type of them should be created, as complement of natural forests, to satisfy future demands?

Mexico demands a long run strategic planning process that will guarantee the availability of natural and artificial forests to attend demands of next generations.

To reduce and eventually control the progressive reduction of the forest ecosystems, implementation of the following actions are urgently needed:

- Start a sustainable forest management program to be applied over all the productive forests of the nation.
- 2) Elaborate and Implement a forest land zoning at state and county level, over all the country.
- With the support of all states governments, operate an efficient mechanism for the effective control of the illegal forest productive chain.
- Promote productive projects in forest lands, for generating employment and rural development.

5) Promote forest plantations for energetic, environmental and productive purposes.

Carry out a permanent nationwide educational and cultural program about the importance of forests and the environment.

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