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THE CHILEAN FORESTRY SECTOR

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INTRODUCTION

Chile has an area of about 755,000 km^2 (75,5 million ha) and administratively is divided into 13 regions, designated I through XII plus the Metropolitan Region in which the capital, Santiago is located (figure).

The northern part of Chile (Regions I through IV) has a desert climate and the central part of the country (Regions IV to VIII) has a Mediterranean-type climate with a southward increase in precipitation. A temperate wet oceanic climate type dominates southern Chile (Regions IX through XII). Native forests are mainly located in this part of the country, while forest plantations are concentrated in Region VII to IX.

2. FOREST RESOURCES

a. Natural forests

Dry forest zone

Characterized by herbaceus vegetation, many of them highly endemic, asociated to short climatic seasonal cycles and herbaceus vegetation in the highlands asociated to small size water bodies. Forets activities are reduced to pasture with camelids and fuelwood gathering.

Mediterranean zone

Mostly dominated with dry shrubs formations that increase in size, high and diversity with precipitation increase, or with more favorable microclimas. The south limit of this region presents forest types related to large human intervention, such gathering of fuelwood for charcoal making, cattle raising and silviculture as mixed activities, and lately, plantation establishment of exotic forest species.

Temperate rain forest zone

Compared with their tropical equivalent, temperate rain forest cover only a small proportion of the globe, probably one of the last extensive areas of this type of forest is located in southern Chile, in a relatively narrow strip of land between the Pacific coast and the Andes which in many parts is no more than 80km wide. This forests is the home of many fine timber producing species, most of which have a history of local use but are less commonly seen in international trade.

The most significant are the southern beeches (Nothofagus species) and the conifers - three of which are now very depleted and protected by legislation banning international trade.

The commercially viable indigenous forest can be divided into first and second growth, covering 850,000 and 586,000 ha respectively. Species such as rauli (a beech type of tree), roble, coigue, tepa and lenga are to be found in the native forest in central and southern Chile.

There are three main vegetation types :

North : Nothofagus spp. forest in the upper part of the cordilleras and dry shurb formations in the lower part and flatlands. Industrial forest activities mostly related to Pinus radiata and Eucalyptus spp. located where natural vegetation was eliminated by intensive use with agricultural crops at the beginning of the century.

Central : Temperate rain forest with a large diversity of species on volcanic and granitic soils. Forest activities are mostly related to selective extraction of timber for sawmills and fuelwood use.

South : Subpolar pure forests where Nothofagus species dominate. Forest activities are concentrated in high quality timber and pulp and paper industries.

b. Forest Plantations

About 11% of Chile's land area is covered by forest, with the scope for further planting. From 2,000 ha plantations established in the 30s, radiata pine now covers 1,1 million ha, concentrated in Central Chile around Talca, Concepción

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and Temuco. Eucalyptus is also grown on plantation, but on a smaller scale: around 70,000 ha at the end of 1988.

In 1990 forest plantations covered 1.45 million ha. There has been no recent national inventory of native forests, but the area covered by potentially productive native forests in 1991 was estimated at 7.61 million ha (INFOR, 1991). An inventory of the natural forest is underway, while plantation forestry information is periodically updated by the Instituto Forestal .

The total standing timber volume of potentially productive native forests in Chile was estimated in 1991 at 915 million m^3, and that of forests plantations at 175 million m^3, mainly *Radiata pine* and *Eucalytpus globulus* (INFOR, 1991).

Resource availability contrasts with industrial forest production. *Radiata pine* with only 14% of the forest area, provide at least 90% of the roundwood for industrial production and exports, excluding fuelwood (CORMA, 1991; INFOR, 1991). This situation does not mean that native forest are being excluded from logging. The main use of timber in these forests is for fuelwood production and the annual harvest for this purpose is estimated at 8-10 million m^3 (Lara, 1985) compared to 14.3 million m^3 harvested for industrial production and export of roundwood and chips in 1990 (INFOR, 1991).

Since 1975 Chile has invested heavily in its forest plantations and today, its wood products have exceeded US$780m and radiata pine production can expect to reach 5 million m by the year 2000.

Forestry has made a significant contribution to the national economy in the last 20 years, with exports of wood products growing from US$324m in 1985 to US$784m in 1989, about 10% of the total. In the international forest products market Chile accounts for less than 1% of the world trade.

c. Forest Laws

Chile's commitment to forest development is encapsuled in Decree Law 701, which came into force in 1975, to stimulate planting and regeneration. In the first three years after its introduction more than 280,000ha were planted by the public sector.

Under the decree, which this year 1994 has been recently reinforced for two

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more years, forests are monitored closely by the national forestry corporation CONAF.

The fundamentals points of the law are that forests must be conserved and managed, to ensure that quality and quantity are sustained, and almost without exception, native forest may not be replaced with plantation species such as pine or eucalyptus.

Another function of the decree was to encourage the private sector to invest in forestry by offering generous subsidies, tax exemptions and security of ownership. In 1979 the private sector planted more than 52,000ha.

Inevitably, it was larger companies which were able to invest most heavily in forestry and more than half of the radiata plantations are owned by two large groups : Arauco and CMPC.

The native forest is more widely distributed, although five major players - CAP, Magallánica de Bosques, Focura, Lenga Indufor and Emasil - own 203.000ha among them.

According to ProChile's international magazine on exports, investment and the economy's log consumption is about 12.3 million m . About 35% goes into pulp and paper, 45% is taken up by sawmilling and just over 4% by panel products manufacturers. The balance is exported.

3. ACHIEVEMENTS OF FOREST POLICY

The main achievements of forest national policy in the last 20 to 30 years are :

- Increase in area of plantations and exports
- Increase investments in forest industries and improvement of port facilities
- Important progress in forest legislation (enforcement of forest management plan)
- Development of a well organized and efficient fire-management program
- Promotion of adequate management of plantations, subsidizing administrative as well as pruning costs
- Soil conservation and land reclamation has been promoted the grants given for planting grass species (mainly *Ammophyla arenaria*) for the control of sand dunes

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- Increasing of forage resources and reducing soil erosion in over 35,000 ha of arid zones through subsidized planting of *Atriplex repanda* and *A. nummularia* shrubs in Region IV
- Important progress in the management of many national parks and other protected areas areas has been made
- Promotion of forest research and development through the project "Investigación y desarrollo forestal" funded by CONAF, UNDP and FAO. Research has been contracted from universities and consultants

4. LIMITATIONS OF FOREST POLICY

Main limitations of the forest policy are :

- Restricted diversity of the products that can be obtained because the two species planted as monocultures represent over 93% of the area under plantation in Chile
- Plantation are vulnerable to pests and diseases. Native and introduced insects and diseases pose a potential threat to Chile's Radiata pine forests
- Economic concentration favouring large companies of the forestry sector. Most of the benefits and support given by the government to the forestry sector during the 1970's and the 1980's were received by only a few corporations
- Low growth in employment in the forestry sector in spite of the dramatic growth in the area of plantations. This includes low salaries, high job instability and inadequate comfort and hygienic conditions in labour camps, which have also limited the contribution of the forestry sector to the economic and social welfare of the population

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5. ENVIRONMENTAL ISSUES IN THE THE FORESTRY SECTOR

Recomendations for future plantation plans :

- Species diversification in forest plantations. There are several native and exotic species suitable for afforestation projects, adequate to the great environmental heterogeneity of the country

- The change from mono-especific plantations towards mixed plantations has also been recommended. *Radiata pine* and *Acacia melanoxylon* can be mixed in plantations for Region VIII because of the potential role in atmopheric nitrogen fixation, rapid growth and high price for the latter

- Better geographic distribution of plantation. Now most plantations are concentrated in three to four regions. An increase in plantations in other regions would be beneficial for the increase and conservation of forest and soil resources as well as for economic and social development

- Diversification of products and services from plantations, other than the industrial timber. This should be a priority. Adequately planned and managed plantations can play an important role in fuelwood production, soil and water conservation as well as forage production. Radiata pine plantations with lower densities than those used traditionally have demonstrated a good potential for a combined use of livestock and timber

- Key role of subsidies and other incentives in forest policy

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