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A WFI MARKET BRIEF SERIES

February 1999

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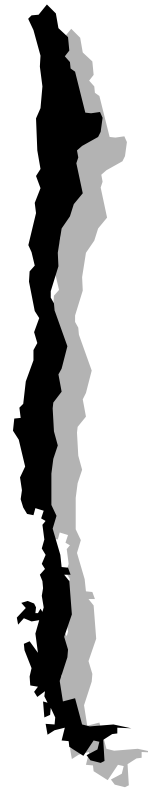
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4033 SW Canyon Road
Portland, Oregon 97221
Tel: (503) 228-0803 Fax: (503) 228-3624
Email: wfiwfc@ix.netcom.com

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Chile's successful forestry sector is the result of twenty years of strong government incentives encouraging the development of fast growing pine and eucalyptus plantations. Today, Chile is one of the principal forestry countries in the world. While its resource base is smaller than Brazil's, the Chilean forestry sector has led the way for other forestry nations in South America.

Intensive management and government incentives have produced the world's largest acreage of radiata pine. Native forests, which outnumber plantations more than six to one, generally serve a protective and recreational role in Chilean forestry. However, improved silvicultural management is expected to yield more productive native forests, offering additional resource potential for Chile's forest industry.

Until now, the Chilean forest industry has focused on woodchips, pulp and paper, log exports and sawn lumber. The next few years will see another burst of growth as the industry moves into value added processing, diversifies into different markets, expands its push into the American market, and develops its native forests as a fiber resource for industrial production.

Plantation Development

Although Chile has always been well endowed with native forests, the forest industry really took off after the government enacted D.L. 701 in 1974. This legal decree opened the gate to the establishment of commercial plantations with fast growth species, under a national framework that promoted foreign investment and exports. The government has invested \$300 million over the last 20 years to support 75% of the plantation costs. By 1994, this had resulted in plantations reaching 800,000 hectares.

During the first six years of this decade, DL 701 opened the door to more than \$3 billion in investment and this is estimated to reach \$5 billion by 2005. These investments have borne significant results. The value of the timber on the forestland, not including the direct support from the government and the costs paid for the owners until 1996, is estimated at \$1.8 billion. That means a benefit-cost ratio of six times the government investment.

Taxes generated by the primary forest industry reached \$352 million for the period, while taxes

D.L. 701

- Intensive silvicultural treatment of 300,000 hectares, resulting in improved fiber supply for value-added production.
- Recovery and stabilization of 7,000 hectares of dunes.
- Allocation of 9% of funds for small forestland owners (less than 200 hectares), and 6% for 200-500 hectares forestland owners.
- 45% of the resulting plantations supply the pulp and paper industry, which account for 46% of Chilean forestry exports.
- 93% of plantations are of radiata pine, while forage species (that support cattle in dry areas), eucalyptus, and others occupy the remaining 7%.

from secondary industries have generated five times as much. After 24 years, the government's investment and incentives have promoted the development of Chile's forestry sector into a modern and competitive industry with an excellent positive balance for the country. Chile's success has become an example for many countries that have started to copy their plantation strategy.

Forest Resources

Located between the Pacific Ocean and the impressive Andes mountains, Chile finds itself under varying climates and vegetation. A remarkable 45% of Chile's total land area is potential land for forestry.

The forest resource in Chile is divided into native forest and commercial plantations. The native forest area is 13,443,316 hectares or 17.8% of the total national area, while plantations cover 2,118,836 hectares (2.8% total national area).

Forest Type (hectares)

Native Forest	13,443,316
Mature Forest	5,978,200
Second Growth Forest	3,582,408
Second Growth Mature Forest	865,446
Non-Commercial Native Forest	3,017,262
Commercial Plantation	2,118,836
Mixed Forest	85,742
TOTAL	15,647,849

Source: Conaf, 1997

Native Forests

The native forest is noted for its diverse hardwood species. Native woods are principally used in the domestic market, for woodchip exports to Asia, and for some exports to Europe. Evergreens dominate in the native forest, accounting for 32% of the total native forest. The second most important species is Lenga, covering 3,400,346 hectares.

An important area of this forest is protected by the Chilean Forestry Services (Conaf) under the classification of SNASPE (national parks, natural monuments, etc).

Native Species (hectares)

Forest	Area
Evergreen (Siempreverde)	4,350,814
Lenga (Nothofagus pumilio)	3,400,346
Coihue de Magallanes (Nothofagus)	1,801,637
Roble-Raulí-Coihue (Nothofagus)	1,370,218
Cipres de las Guatedas	972,181
Coihue-Raulí-Tepa (Nothofagus & Laurelia)	456,919
Esclerofilo (Acacia Caven)	342,631
Alerce	264,993
Araucaria	253,715
Roble-Hualo (Nothofagus)	184,783
Ciprés de la Cordillera	45,079
Total	13,443,316

Source: Conaf, 1997

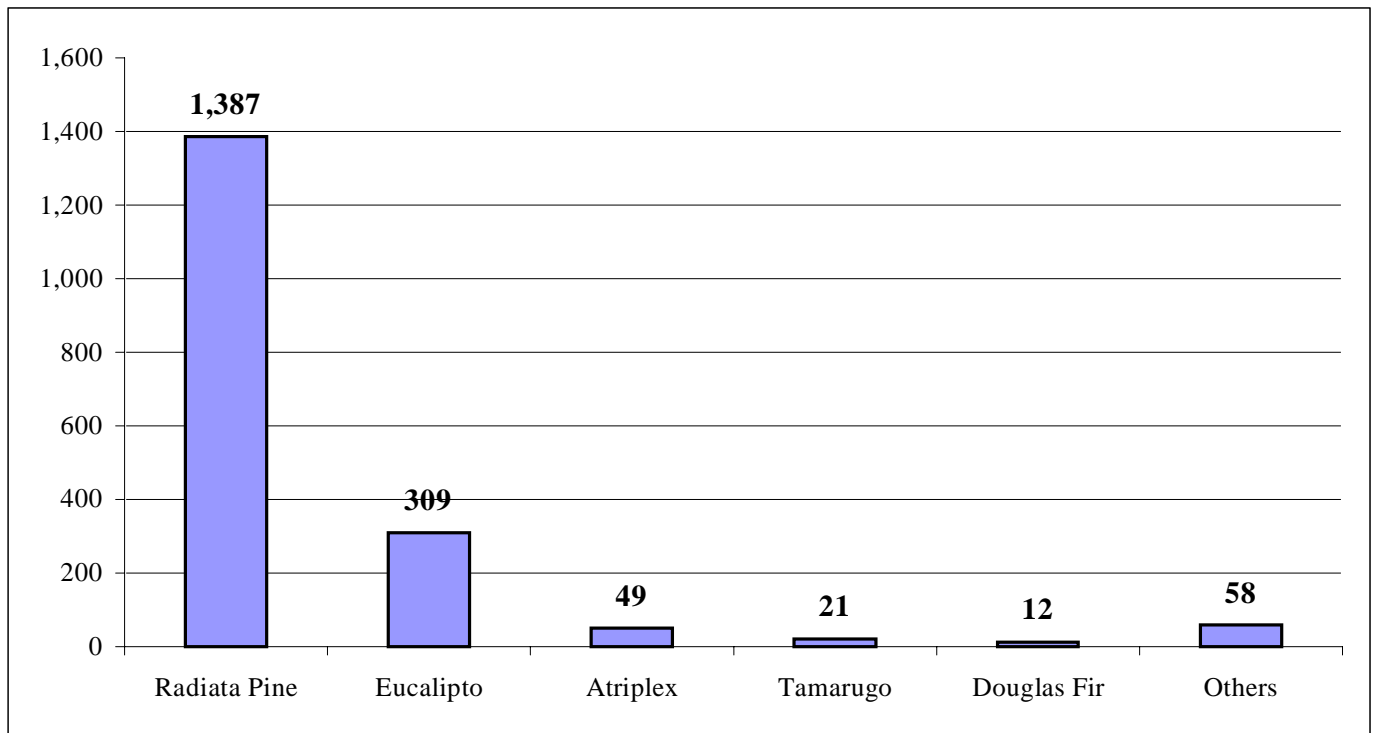
Commercial Plantations

While native forests account for 85.9 % of the total forestland in Chile, the engine of growth for the forestry industry has been Chile's commercial plantations, which cover an area of 2,118,836 hectares. 83% of these plantations are radiata pine, with the remaining 17% composed of eucalyptus, poplar, and others. The purpose of these forests is the production of supplies for the pulp and paper, panel, and lumber industries that form the core of the Chilean forestry industry and its export sector. Over the last five years the plantation rate has reached 100 thousand hectares per year.

Exhibiting fast growth and high productive volume--15-40 m³/ha/year--Chile's pine plantations have supported the growing forest industry. The major distribution for radiata pine is between the V and X regions (see map on page 12). Region VIII, which holds 47% of the total pine area, also holds 50% of the pine volume, reaching 200 million m³. The average rotation ages are 10 years for pulp logs, and between 20-25 years for sawlogs.

After radiata pine, eucalyptus plantations are the second most important species. Eucalyptus plantings have grown substantially since 1989, when the planting area was just 17,595 hectares. During the period 1990-1996, the average planting area per year was 36,000 hectares. The average annual growth rate is 20 m³/ha/year in semi arid areas and 45-60 m³/ha/year in the region VIII. There are now some 309,000 hectares of eucalyptus plantations.

Commercial Plantation Species (1000 hectares)

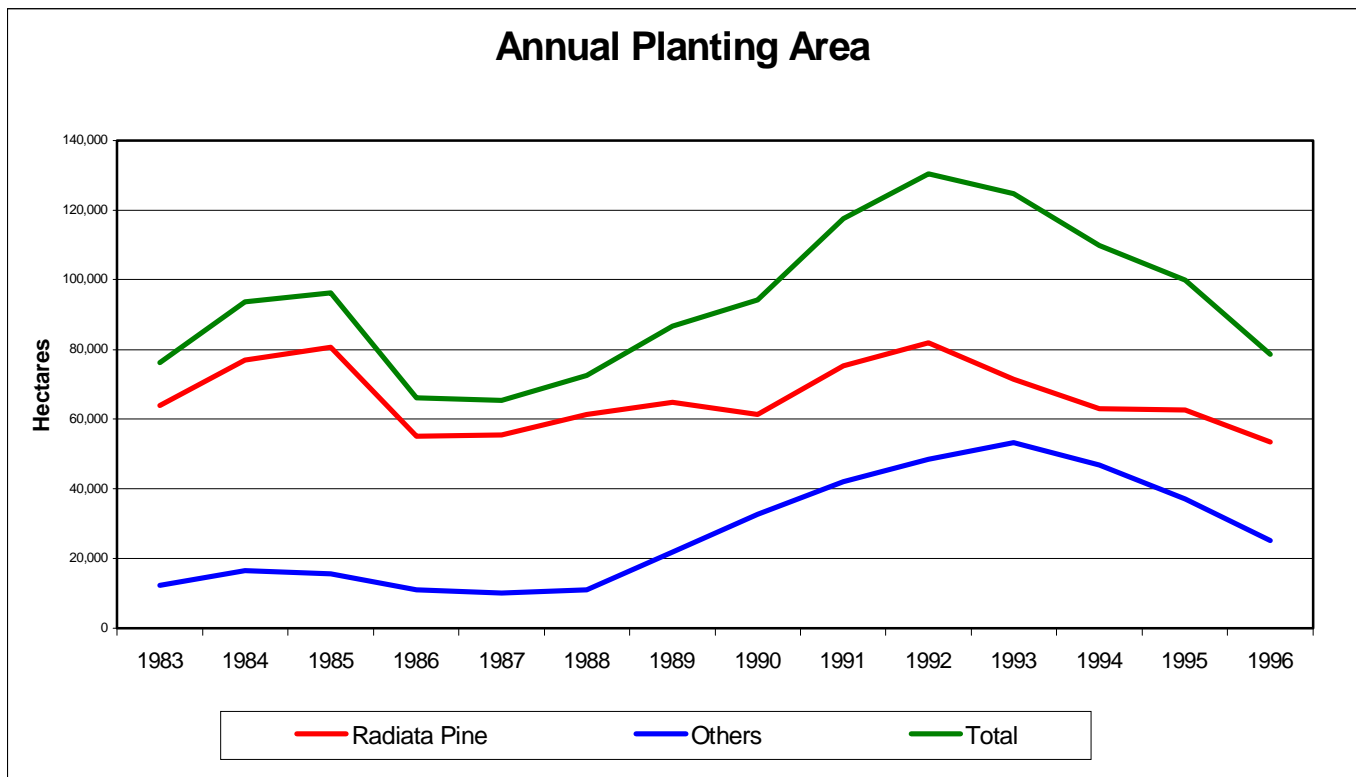


Source: Infor 1997

Annual Planting Area (hectares)

Year	Radiata Pine	Others	Total
1983	63,884	12,396	76,280
1984	76,982	16,620	93,602
1985	80,630	15,647	96,277
1986	55,058	11,137	66,195
1987	55,386	10,055	65,441
1988	61,405	11,103	72,508
1989	64,882	21,820	86,702
1990	61,310	32,820	94,130
1991	75,416	42,026	117,442
1992	81,868	48,561	130,429
1993	71,411	53,293	124,704
1994	63,061	46,824	109,885
1995	62,723	37,134	99,857
1996	53,444	25,149	78,593

Source : Infor, 1997



Source : Infor, 1997

Radiata Pine

Chile's radiata pine plantations are young stands. 80% of the plantations are younger than 20 years old, and the volume is concentrated in stands 11-20 years old. This means that within the next five years, Chile's radiata plantations will be ready to use for sawn lumber and value added production.

The quality of this timber will also be improved from previous generations. At least a third of the plantation area has been intensively managed with silvicultural treatment. The resulting yield is higher, and the wood has fewer knots.

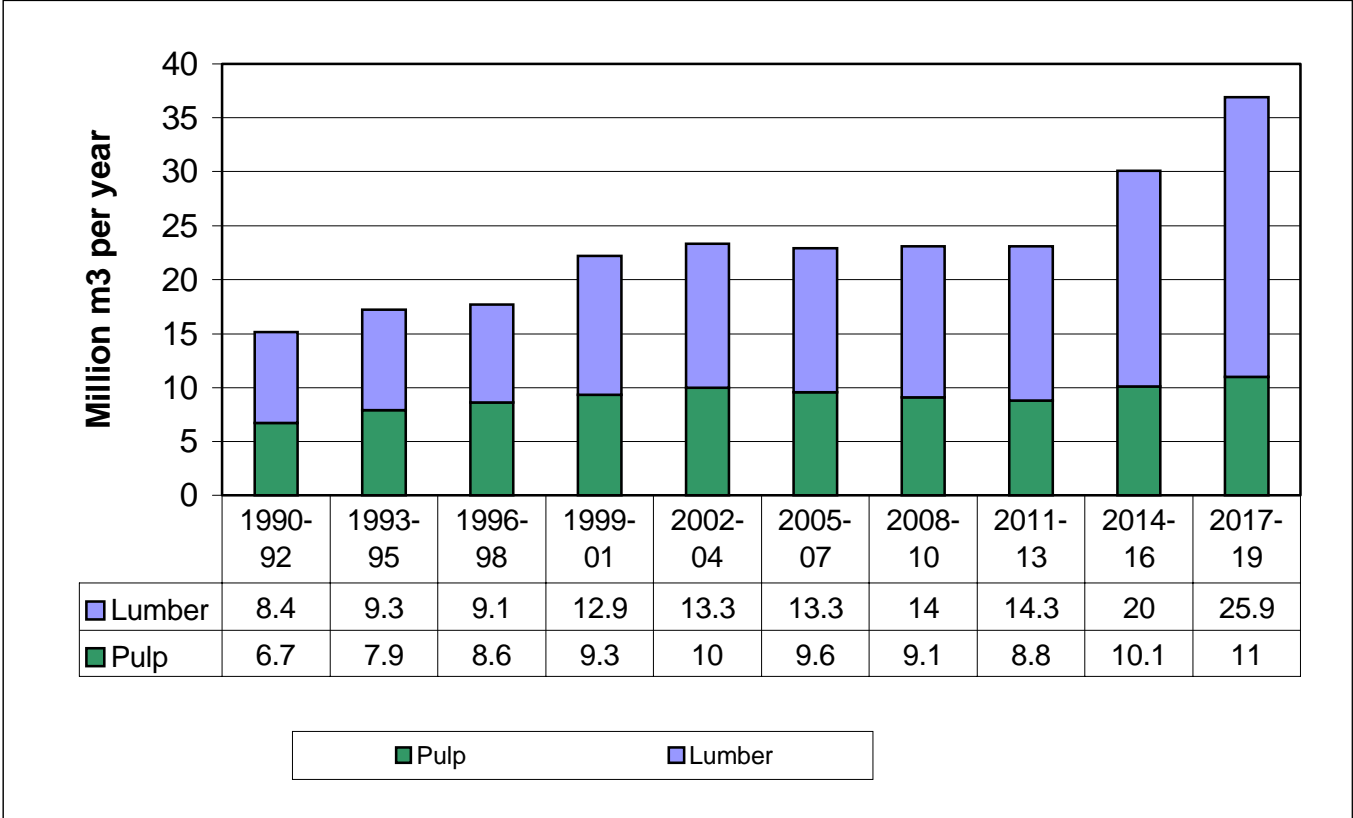
Studies on timber availability of radiata pine indicate that there will be an increase in the future. In the year 2000, the annual volume available should reach 22.2 million cubic meters, and in 2015 this value will be over 30 million cubic meters.

Plantation Area by Region and Species (hectares)

Region	Radiata Pine	Eucalyptus	Others	Total
I	-	178	24,313	24,491
II	-	1	601	602
III	1	829	893	1,723
IV	655	2,143	51,897	54,695
V	15,583	35,856	5,233	56,672
R.M.	1,001	9,927	1,731	12,659
VI	59,715	22,002	2,307	84,024
VII	326,422	16,400	4,527	347,349
VIII	642,705	111,228	7,983	761,916
IX	224,672	67,994	10,174	302,840
X	116,017	42,204	8,182	166,403
XI	-	-	22,561	22,561
XII	-	-	50	50
Total	1,387,041	308,762	140,182	1,835,985

Source: Infor, 1997

Projected Radiata Wood Use by Industry 1990-2019



Source : Infor, 1997

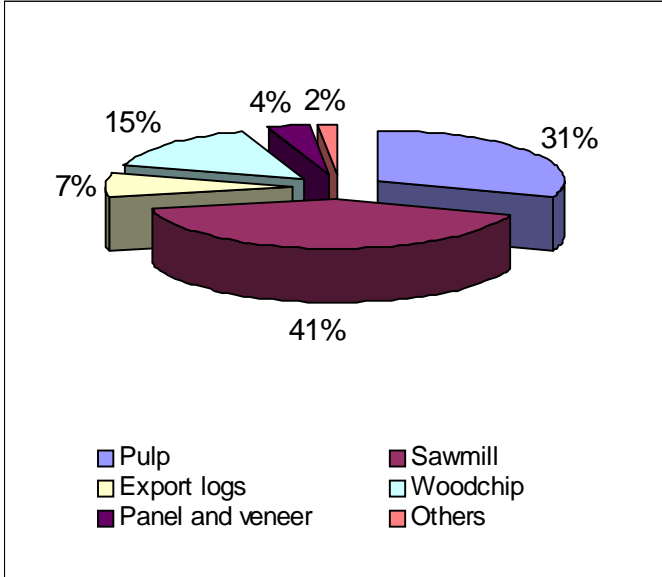
Forest Industry

The Chilean forest industry has enjoyed incredible growth during the last decade. The total roundwood consumption has increased from 4.9 million m³ in 1974 to 22.9 million m³ in 1996.

The sawmill industry ranks first in roundwood consumption, although the pulp and paper industry is the most important sector economically.

In the last three years, economic malaise in Asia has pushed forestry production down. This trend has affected almost all forest products, with the exception of the secondary industry (moulding, furniture, doors, etc) which has a strong market in the USA.

1997 Roundwood Consumption by value



Source : Infor, 1997

Radiata Wood Use by Industry

Product	Thousands	Production 96	Production 97
Pulp	MT	2,114	2,052.7
Newsprint	MT	197	183.9
Other papers and cardboard	MT	399	430.1
Woodchips	m ³	6,184	4,032.7
Sawn lumber	m ³	4,140	4,661.3
Radiata pine lumber	m ³	3,744	na
Other sawn lumber	m ³	396	na
Particleboard	m ³	379	424.6
Fiberboard	m ³	391	464.1
Plywood	m ³	69	65.4
Veneer	m ³	87	97.5

Source : Infor, 1997

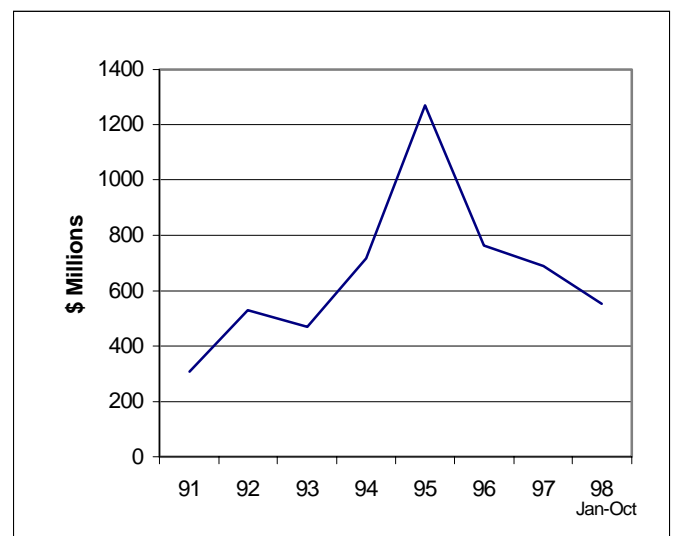
Pulp and Paper

Chile is a major pulp and paper exporter. Its pulp and paper industry has earned an excellent reputation in the international market. The development of this industry is based in fast growth commercial plantations of Pine and Eucalyptus.

Pulp production started in 1959, with the opening of the CMPC facility in Laja (VIII region). In the 70's, two new plants, owned by Celulosa Arauco y Constitución, were incorporated into the industry. The industry grew most during the 80's, with operations under Arauco II, Celulosa del Pacífico, Celulosa Licantel, and Forestal e Industrial Santa Fe coming online.

Chile is a modern pulp producer. In 1998, 60% of the production came from plants with less than 10 years in operation. The raw material for this industry comes from plantations and recycled paper. 200 thousand tons of paper are reused which is equivalent to 30% of the national consumption of paper and cardboard in Chile.

Value of Pulp Exports



Source : Conaf, 1998

In 1995, pulp exports reached \$1,270.4 million, an increase of 40% compared to 1994. However, the economic crisis in Asia (the principal market for Chile) and the devaluation of pulp prices in the major markets resulted in a fall in

exports over the last three years. In 1998, exports reached \$551.9 million during the period between January and October. April registered strong export growth, due largely to sales of cellulose to China, worth \$49 million. This put China in the top five export destinations for all forestry exports.

Round timber is another Chilean exported forestry product. The pulplogs are from pine and eucalyptus plantations and the sawlogs are from pine plantations. In 1997, log exports reached \$106.9 million with a volume of 1,729 thousands cubic meters. During the period of January-October, the exports of this product reached \$15.9 million in 1998.

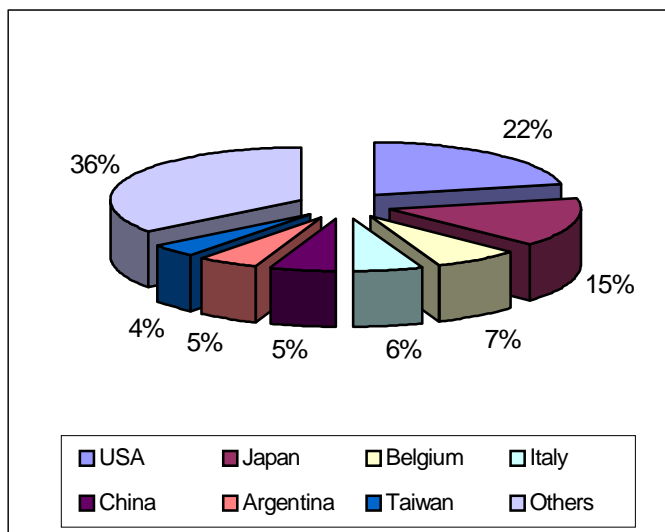
Forestry Exports

Chile's forestry sector is very export-oriented. Every year, forestry exports account for more than 14% of the national total export, giving employment to a hundred thousand people. In 1997, forest product exports reached FOB \$1,829.9 million with a volume of 7,753,328.7 tons.

The major markets for the Chilean forest industry are Asia (50%), Europe (20%), and South America (17%). The principal export products are pulp and paper (54%), woodchips (9.8%), sawn lumber (9.4%), and logs (6.1%).

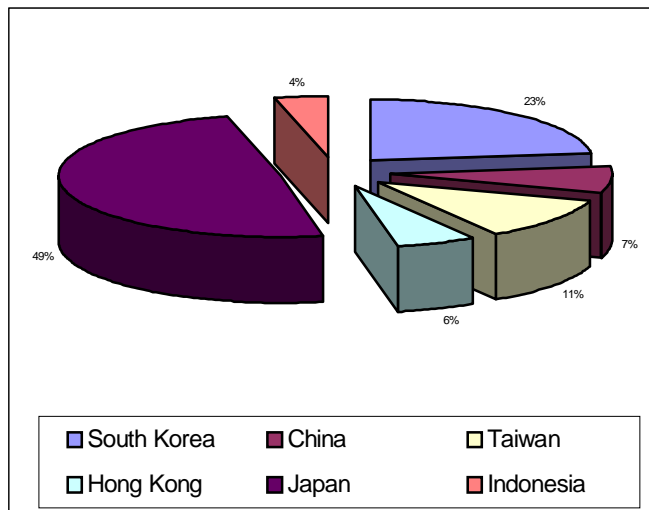
1998 was a difficult year for Chilean forestry, with production indices falling for pulp, sawn lumber, panels, and paper. Exports reached about \$1660 million, a fall of 9.3% in comparison to 1997.

1998 Main Export Destinations by Value



Source : Infor, 1998

1997 Asian Export Destinations by Value



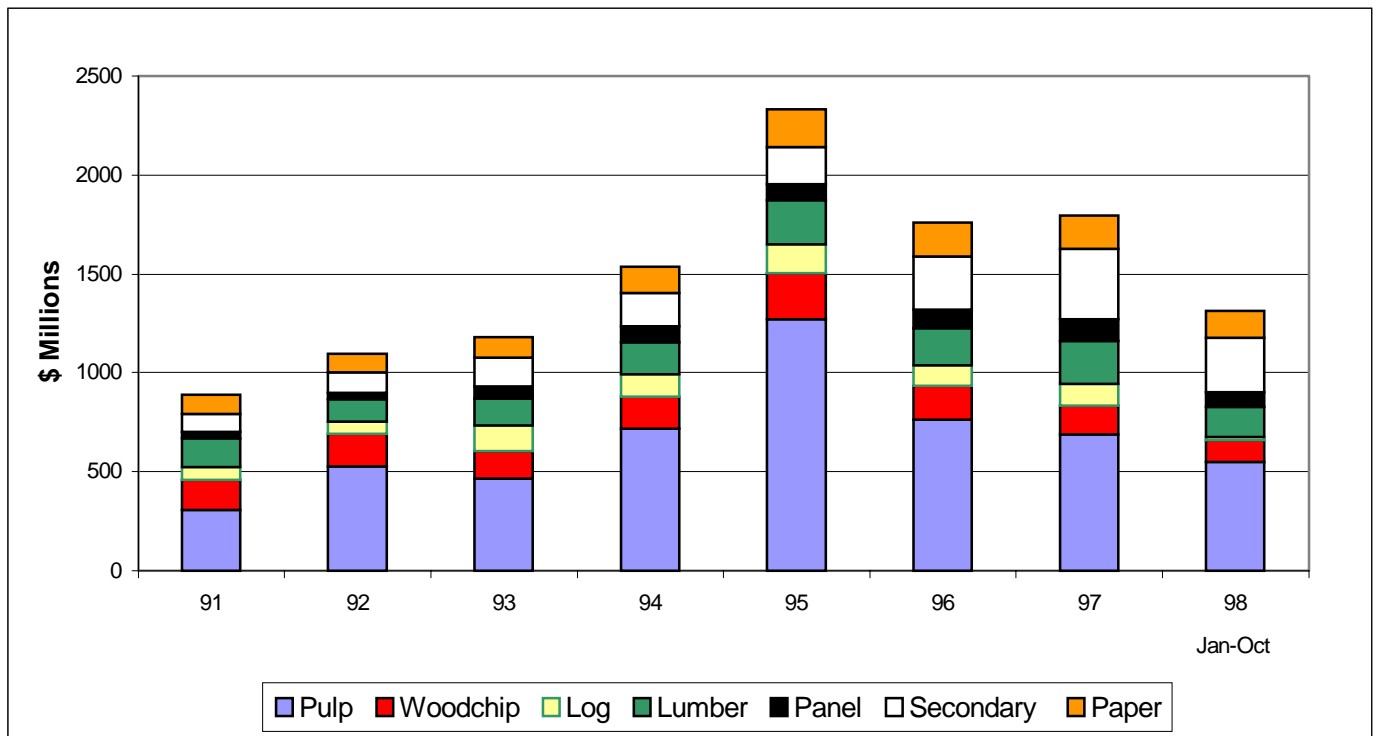
Source : Infor, 1998

After pulp, lumber is the second most important export. 90% of lumber exports come from radiata pine plantations. In 1997 exports accounted for \$217.4 million, falling to \$136.3 million in the period January-October 1998.

Woodchip production comes from the native forest and from eucalyptus plantations. This raw material is used in short fiber pulp production in Asian countries. In the last three years the export of this product has decreased, falling to \$95.5 million in 1998.

The panel industry has expanded rapidly over the last decade. However, this sector is a small component of the Chilean forest products industry. In 1997 exports reached \$110.4 million, and during the first 10 months of 1998 the value exported was \$63.2 million.

Value of Forestry Exports by Product 1991-98



Source : Infor, 1998

Forestry Exports by Product

Product	Volume (1996)	Unit	Income 1996 (Thousand \$)	Income 1997 (Thousand \$)
Pulp	1,655,164	MT	764,372	689,200
Paper	138,218	MT	98,038	76,600
Sawn Lumber	1,087,108	m3	185,593	217,400
Sawn roundwood	1,409,744	m3	91,959	91,900
Pulp roundwood	206,015	m3	11,587	14,900
Lumber	112,333	m3	43,603	79,100
Wood chip	2,906,147	MT	170,895	147,000
Plywood and veneer	248,981	MT	96,182	110,400
Cardboard	57,864	MT	76,908	89,300
Others	181,162	MT	268,778	314,100
Total			1,807,916	1,829,900

Source : Infor, 1998

Chile's forestry exports are dominated by a handful of large companies. The Arauco holding group includes Celulosa Arauco, Aserraderos Arauco, and Inforsa. This group is Chile's largest exporter of wood pulp and sawn timber. It owns 497,000 hectares planted primarily with radiata pine.

CMPC is another major forestry group. Its subsidiaries and affiliates include Exportadora e Importadora CMPC, Celulosa del Pacifico, and Aserraderos Mininco. Its operations cover forest products, pulp, paper, boxboard, and tissue products. CMPC owns 500,249 hectares in Chile, and another 47,000 hectares in Argentina.

1998 Main Exporting Companies

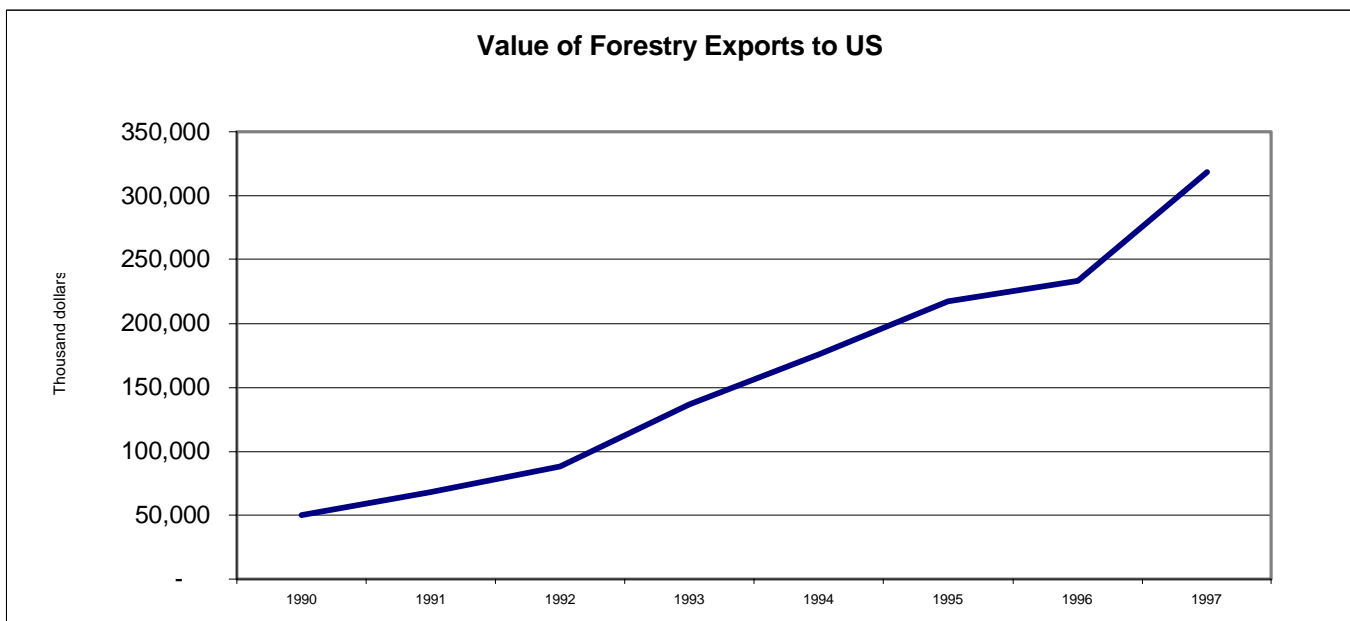
Company	1000\$
Celulosa Arauco	365,421
CMPC	156,024
Celulosa del Pacifico	150,155
Aserraderos Arauco	108,556
Aserraderos Mininco	65,283
Andinos	50,530
Inforsa	39,546
Others	724,987

Source : Infor, 1998

Exports to US

Forestry exports of 460 products were destined for 95 countries, via 900 export companies in 1997. After Japan, the USA was the second major market for value added products. Forestry exports to the US market have been increasing over the last few years. In 1990 exports to the USA reached \$50,443 thousand; since then, the export rate to the USA has increased constantly reaching \$318,344 thousand in 1997. Exports to the US accounted for 17% of total forestry exports in 1997. This trend was made

possible because of the strict quality control and constant promotion of Chilean forest products in the American market. However, in 1997 the California Courts ruled that new import permits for logs, lumber, and non-manufactured forest products coming from temperate forests would be temporarily halted. This prohibition resulted in the cancellation of several investment plans in Chile. The injunction was lifted in January 1999.



Source : Infor, 1998

Forestry Exports to US

Product	Volume '95	Value M\$	Volume '96	Value M\$	Volume '97	Value M\$
MDF board (MT)	2,269	1,159	3,401	1,827	8,778.5	4,048
Other furniture (MT)	696	1,885	952	2,555	1,533.1	4,663
Unbleached Pulp (MT)	13,382	9,140	14,249	5,274	12,019.7	4,804
MDF moulding (MT)	335	382	1,033	817	6,930.9	6,023
Laminated panels (MT)	3,181	5,349	5,171	8,582	4,081.3	6,310
Finger joint lumber (MT)	3,694	1,957	11,167	4,661	18,257.6	7,823
Office furniture (MT)	4,134	6,619	6,542	7,158	5,187.1	8,339
Dressers and bedside tables (MT)	1,101	3,334	1,358	4,191	na	8,621
Furniture parts (MT)	3,584	6,486	3,068	6,424	5,329.7	9,561
Doors (MT)	3,522	6,921	3,068	5,993	5,379.6	10,846
Clear lumber block (m ³)	34,435	12,434	49,381	17,167	55,101.7	18,861
Bleached pulp (MT)	26,271	17,413	38,411	20,313	44,278.2	20,068
Door jambs (MT)	21,433	28,149	21,759	31,291	22,314.9	35,625
Others	-	39,702	-	39,087	-	37,862
Planed Lumber (m ³)	25,783	8,918	32,787	13,159	103,641.0	39,478
Moulding (MT)	32,536	43,045	37,720	51,372	54,249.9	79,852
Sawn lumber (m ³)	87,393	24,301	56,958	13,327	67,722.7	15,600
Total	-	217,193	-	233,198	-	318,344

Sector Outlook

A number of issues present challenges for Chile's forestry sector. First, Asia's financial turmoil has adversely affected Chilean forestry production and exports. Traditionally dependent on exports to Asia, the forestry sector is beginning to shift some of its markets elsewhere. Chilean manufacturers are improving their production processes, adding value to the final product, and entering Southern and North American markets. Pulp and paper companies, which had already invested in Argentina and Uruguay, are now expanding into Peru, Brazil, and Venezuela. Investments include purchases of forest land, and the construction of pulp and paper mills, panel plants, woodchip facilities, sawmills and re-manufacturing facilities.

Second, environmental concerns such as forest fires and the substitution of native forest for plantations continues to present challenges to the sector. Every year Chile's fire season (November to April) results in 5,000 fires damaging an area of 50,000 ha. Direct losses have reached \$47 million annually. Environmental pressures have halted several private investment projects. However, the regulations in Chile are clear and such problems can be avoided by submitting the required forest management plans and environmental impact assessments.

Third, there is increasing competition in Chile for land. Although available forest land is about 60%, the best land has already been planted, is covered with native forests or is used for agriculture. The value of good land continues to rise, and there is also the problem of road access in mountainous areas.

In response, Chile is taking important measures to improve and strengthen the forest industry, for example: improving public infrastructure such as ports, railroads, roads, labor force conditions; opening of new markets; strengthening scientific and technological research; and planting widely with intensive management, since just 34% of the potential forestry land is covered with forest (11.6 million hectares).

Investment in the forestry sector is expected to continue. Investment funds are estimated to reach \$5 billion by 2005. 80% of this investment will be in the pulp and paper sector, with the remaining capital going to plantation activities (7.8%), sawmilling and manufacturing (6.4%), panel and veneer industries (4.6%), and other activities (1.2%).

Chile's native forests are not being ignored. The Chilean forestry service (Conaf) will use financial support from the German government to invest \$8.5 million in improving and managing its native forest stock. Eventually, the goal is to produce high quality native timbers that will be utilized in the industrial sector.

