Chapter 5
Chile's forest products markets—a plantation success story[1]

Highlights

- Since the 1950s when Chile introduced large commercial plantations of radiata pine and eucalyptus, which span over 2 million hectares today, dependency on the native hardwoods has decreased dramatically.
- Roundwood production from plantation radiata pine is expected to double to 37 million m^3 in 15 years. With log exports being minor, 41% of harvest in 2001 was processed into sawnwood, 31% into pulp and the balance used for structural and non-structural panels.
- Eucalyptus is increasing increasingly upgraded into solid wood applications rather than its traditional uses for firewood and pulp.
- Approximately 75% of the production of primary (pulp, paper, panels and sawnwood) and secondary products (engineered wood products, doors, windows, interior finish items and furniture and furniture components) is exported, mainly to the United States, followed by Japan and China, respectively.
- Over the last decade, wood products exports, worth $2.2 billion, have more than doubled, mainly as a result of the six-fold increase in value of further-processed wood products exports.
- Forest products exports constitute 13% of Chile's total exports today by value.
- Imports of wood products into Chile are already significant, at almost $540 million in 2001, and with expectations for continued GDP per capita growth, imports of paper, millwork and furniture are expected to increase.
- All of the plantation forests in Chile are privately owned, and with high industry concentration.
- There is a growing trend for Chilean forest product companies to invest their capital in other Latin American countries, including plantations, manufacturing facilities, and sales offices.
- Over 50% of Chile's plantation forests are managed with an environmental management system complying with ISO 14001, with the area growing steadily.

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Secretariat introduction

Chile's rapidly expanding forest products trade is influencing markets within the UNECE region, as well as competing for market share in some of the same export markets. Despite growing domestic consumption, with softwood and hardwood plantation-grown wood that will double in volume in the next 15 years, Chile will become an even greater player in world markets. Chile is not the only country in the southern hemisphere to benefit from fast-growing plantations, as more countries' forest resources are based on planted stock. However, Chile has capitalized on its raw material by simultaneously developing a forest products industry to manufacture both primary and further-processed products

This chapter is one of a continuing series of special chapters in the *Review* that features a country's wood products markets, either a trading partner or a competitor, from outside the UNECE region. The *Forest Products Annual Market Review, 1999-2000* featured a similar chapter on New Zealand's forest products markets.

The secretariat would like to express sincere appreciation to Mr. David Cartwright, Forestry Consultant and Special Advisor to the Canadian Council of Forest Industries and Dr. Christopher Gaston, Group Leader, Markets & Economics, Forintek Canada Corporation, for this insightful chapter on Chile's forest products sector. Dr. Gaston is the Leader of the new UNECE and FAO Team of Specialists on Forest Products Markets and Marketing.

5.1 Introduction

Chile's forest industry has experienced dynamic development during the past thirty years. In 1974, a re-activated Government-led programme provided incentives that resulted in the establishment of two million hectares of plantation forests, primarily radiata pine and eucalyptus. An integrated industrial infrastructure has been developed to process the raw material resulting from these plantations, developing Chile into a significant exporter of a wide range of wood products to numerous markets around the globe. Chile is a true success story in fibre production, processing both primary and secondary wood products of generally high quality. The Chilean forest industry has established a highly successful worldwide marketing network, and is starting to make investments in processing facilities outside of the country. With the 2001 plantation production of roughly 25 million m^3 of roundwood, and expectations for this to nearly double in the next two decades, Chile is positioned to be an even greater global supplier of forest products.

At the same time, economic growth and the prosperity of the Chilean population poises them to become significant importers of wood products. While to date this has been dominated by paper, there are growing opportunities for imports of solid wood products, especially for interior finish of principal and recreational housing.

5.2 General economic developments

The population of Chile is nearing 15 million people, 28% of which are 14 years of age or younger. The population growth rate is 1.2% and life expectancy at birth is 75.5 years. The literacy rate for the total population 15 years and older is 95.2%.

During the 1991 to 1997 period the growth in real GDP averaged more than 7% annually but dropped to 3% in 2001. It is forecast to increase slightly in 2002 to 3.3%. The export of goods and services in 2001 experienced a 7.1% growth rate in real terms, slightly below the previous year's rate of 7.5%. In 2002 the forecast is for a 4.2% growth rate (Central Bank of Chile, 2002). In 2000, at $10,100, Chile had a respectable purchase power parity adjusted per capita GDP (compared, for example with $6,700 for Costa Rica, $6,500 for Brazil, $2,900 for Ecuador, and $23,400 for Germany) (United States Central Intelligence Agency, 2001).

The annual rate of inflation dropped from 6% in 1997 to 2.6% in 2001. It is forecast to remain low in 2002. During most of the 1990s Chile's unemployment rate remained low averaging about 7%. In February 2002 the unemployment rate had climbed to 9.3% countrywide, and to 13.3% in the Santiago metropolitan region, a reflection of the downturn in the construction sector. This is due in part to depressed global commodity prices and the slowdowns in the Asian economies.

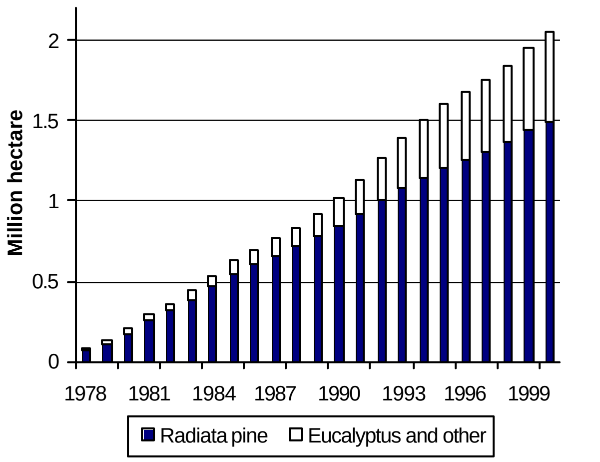
5.3 Forest resources

Chile's temperate forests remained almost intact until the arrival of the Europeans over 450 years ago. The uncontrolled use of fire to clear land for agricultural uses and the harvesting of the more valuable native softwoods and hardwoods have reduced the original forest cover by 44%. Fibre use until quite recently has primarily been for firewood and for sawnwood manufacture for use in construction, shipping and mining.

Today Chile has 15.6 million hectares of forest cover (approximately one fifth of the county's total area), with native forests representing 85.9% (13.4 million hectares) and plantation forests accounting for 13.5% (2.1 million hectares). There is an additional

GRAPH 5.3.1

Cumulative plantation area in Chile, 1978-2000



Source: Instituto Forestal, 2001.

14.1 million hectares of scrub forestlands that are Government-owned and protected (*Instituto Forestal*).

The dependency on the natural hardwoods decreased dramatically with the introduction of plantation forests in the mid-1900s, utilizing introduced species, primarily radiata pine and eucalyptus. In the mid-1970s, this trend toward plantation forestry accelerated through government subsidized planting programmes (graph 5.3.1). This peaked in 1992, with over 130,000 hectares planted that year. To date, Chile has over 2 million hectares of plantation forests exist. Plantation subsidies have been curtailed significantly. No subsidies exist for processing of wood products.

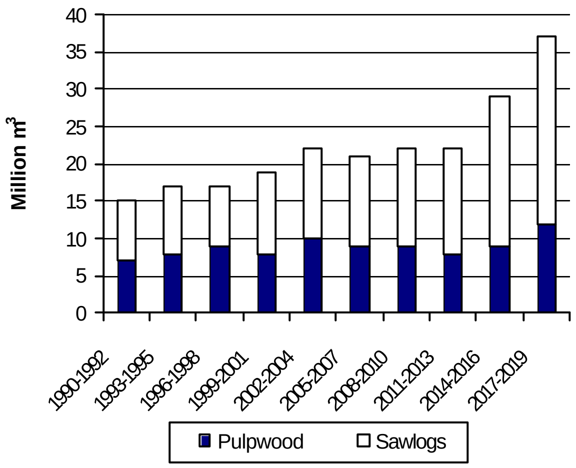
Radiata pine has been the preferred plantation species primarily due to its fast growth rate, averaging 24 m^3/hectare/year (*Instituto Forestal*). It also tends to grow straight and tall with well-spaced, small-sized branches. This species currently represents over 75% of the area planted. Based on established plantation inventories, age classes and annual increments, radiata pine timber production is forecast to increase substantially from an annual harvest of 18.8 million m^3 today to an estimated harvest of 36.9 million m^3 in 2018 (graph 5.3.2) (*Instituto Forestal*). There is, however, a growing interest in faster growing species of eucalyptus that could begin to lessen the dependence on radiata pine. The eucalyptus wood is expected to be used for both high quality, short fibre pulp and wood-based products.

Industrial log consumption has experienced a five-fold increase during the past 25 years, from less than 5 million m^3 in 1976, to over 25 million m^3 today. Plantation forests account for 85% of this supply, with native forests supplying only 15% of the industrial log harvest. Approximately 41% of the industrial log production is processed by the sawmilling sector with 31% destined to the pulp mills, mainly in the form of undersized roundwood resulting from thinning operations. The balance is primarily used for structural and non-structural wood-based panels.

It is of interest to note that an additional 10 million m^3 of wood, equivalent to 40% of the roundwood production, is extracted annually from the forests for use as firewood. The preference is for certain hardwoods from native forests. This often uncontrolled extraction of firewood can cause significant degradation to the mature as well as second growth native forests.

GRAPH 5.3.2

Past, present and projected radiata pine roundwood production, 1990-2020



Source: Instituto Forestal, 2002.

5.4 Institutional framework for forest and wood industries

The majority of the plantation resources in Chile are privately owned. Large owners (six in total, each holding in excess of 5,000 hectares of plantation forests) account for 51% of the total acreage of plantation forests. Medium-sized owners, each holding between 1,000 and 5,000 hectares, represent 15% of the plantation forests (1,100 firms), with the balance owned by small operators (5,400 firms). Native forests are largely owned by the Government and are either very strictly managed for use or totally protected. However, almost 20% of the native forests are owned privately, and managed under strict harvesting guidelines.

Chilean forest policies are implemented through various institutions. The principal public institution is the Corporación Nacional Forestal (CONAF) and its role is to encourage the growth and development of productive forestry activities while protecting and conserving the forests and the forest environment. The Instituto Forestal's (INFOR) objective is to develop the forest industry by providing factual statistical and analytical information about resources, industrial activities, products and markets. The Comisión Nacional del Medio Ambiente (CONAMA) is responsible for environmental issues and the development of a comprehensive national environmental law. The Corporación Chilena de la Madera (CORMA) is the Chilean wood corporation that represents the private sector forest product producers.

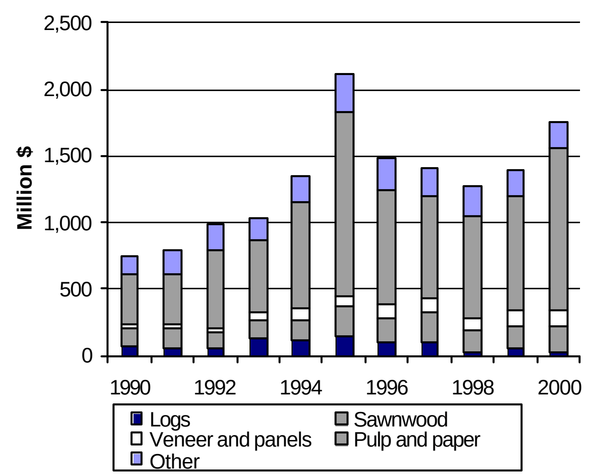
A rising interest in, and concern for, the protection of the environment has resulted in increased controls over the harvesting of native forests. This has delayed implementation of some industrial projects, including chipping and sawmilling operations, reliant on the native hardwood species and has slowed the establishment of plantation forests using introduced species that replace native species.

5.5 Wood industry - production and consumption

Chile's forest industry produces a wide range of wood products, primarily from their radiata pine and eucalyptus plantations, for both export and domestic markets (graphs 5.5.1 and 5.5.2). The sawmilling sector is characterized by the existence of a large number of small sawmills, many owners and wide spatial distribution. However, there is a high concentration of milling capacity in the hands of a few companies. The principal companies are Aserraderos Arauco S.A., Aserraderos Mininco S.A., Andinos S.A. and Forestal

GRAPH 5.5.1

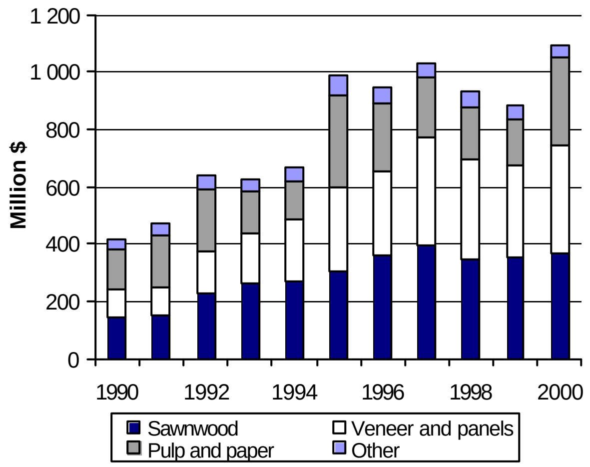
Chilean production of primary forest products for export markets, 1990-2000



Source: Instituto Forestal, 2001.

GRAPH 5.5.2

Chilean production of primary forest products for domestic use, 1990-2000



Source: Instituto Forestal, 2001.

Copihue. It should be noted that there is a low level of foreign investment in both Chile's plantation resources and its processing facilities.

The veneer and plywood industry has undergone significant growth during the past decade as plants have been modernized, facilities have been expanded and new investment made in this sector. Current capacity is 50% particle board, 35% fibreboard (primarily MDF), 10% plywood and 5% veneer production.

Wood chips are produced for the domestic and export market. Most chipping facilities are attached to sawmills processing radiata pine logs and account for 48% of total chip production. Native species account for 39%, with eucalyptus representing the balance, or 13% of total production. About $135 million of chips are exported annually.

The pulp and paper industry is well developed and produces chemical and mechanical pulp, newsprint and other papers (printing, sanitary, facial, corrugated cardboard and cardboard). Six companies account for 87% of installed capacity of approximately three million tons per annum.

In addition to these primary processors there is a well-established secondary manufacturing industrial base that produces a wide range of value-added products. These range from the basic kiln-dried, finger-joined blanks to moldings, doors, windows, and numerous items of furniture. Growth in the production of such value-added products has far outstripped the growth in primary wood products (see section 5.6).

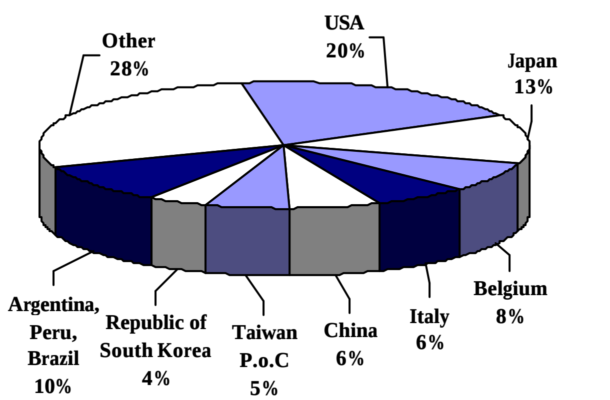
5.6 Trade of wood and wood products

5.6.1 Wood product exports

The growth of Chile's forest industry over the past three decades has depended on the development of foreign markets (graph 5.6.1). Since 1990 the value of forest product exports has more than doubled, reaching $2,200 million in 2001, representing 13% of the country's total exports (graph 5.6.2). The value of forest products exports peaked in 1995 at $2,369 million due largely to the high world prices for wood pulp, particularly during the third quarter of that year. Non-wood forest products exports have also doubled; these include herbs, edible nuts, bark, mushrooms, extracts and essential oils, bamboo poles and charcoal.

GRAPH 5.6.1

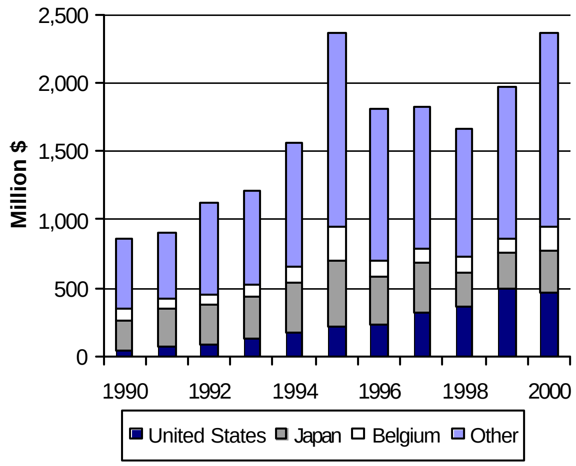
Chilean forest products export destination, 2000



Source: Instituto Forestal, 2002.

GRAPH 5.6.2

Chilean forest products exports by destination, 1990-2000

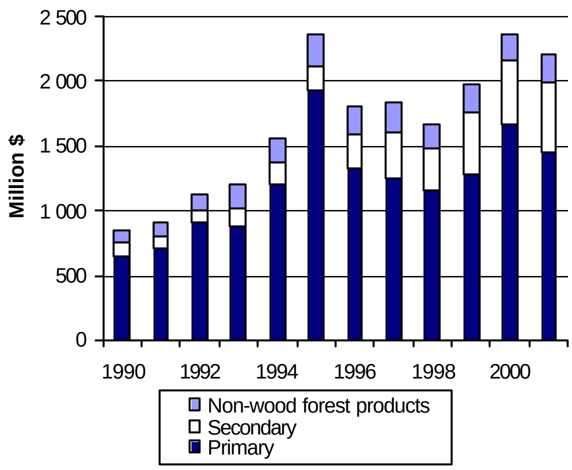


Source: Instituto Forestal, 2002.

While primary wood products account for the largest percentage of the value of exports, the volume and value of secondary value-added wood products is steadily increasing as a percentage of the total. During the past eleven years the value of primary wood product exports has doubled while that of value-added wood products has grown six-fold (graph 5.6.3).

GRAPH 5.6.3

Chilean exports of forest products, 1990-2001



Note: Other is non-wood forest products.
Source: Instituto Forestal, 2002.

Also during the past eleven years the number of exporters, products exported and countries exported to have all experienced moderate growth. The value of exports has, on the other hand, more than doubled (table 5.6.1). Pulp is the largest export item, representing roughly 40% of all wood product exports. The balance includes sawnwood and a wide variety of further-processed products.

TABLE 5.6.1

Diversification of forest product exports and exporters, 1991, 1996 and 2001

	1991	*1996*	*2001*
Value of exports (million $)	913	1 808	2 206
Number of exporters	670	942	968
Number of products exported	385	420	407
Number of countries exported to	76	89	98

Source: Instituto Forestal, 2002.

The United States remains the principal destination for Chile's wood exports, accounting in 2001 for 23.2% of the value of total wood product exports. Japan and China with 12.5% and 10.9%, respectively, follow in importance.

It is important to note that there is a significant difference in terms of the wood products that each of the four principal importing countries purchase (table 5.6.2). The United States imports primarily value-added radiata pine wood products, namely moldings, planed wood, and doors and doorframes. The principal product exported to Japan is eucalyptus wood chips, while China imports primarily softwood pulp. Exports to Mexico have experie nced a significant increase in the last three years, primarily plywood, sawnwood, planed wood and multi-layered paperboard.

5.6.2 Wood products imports

Imports of wood products in 2001 totalled $536 million. 73% of imports were paper, followed by solid wood and manufactured wood products at 13% (table 5.6.3).

TABLE 5.6.2

Wood products exported to the principal markets, 2001
(Million $)

Country and imported product	*2001*	*%*
United States		
Solid wood moldings	127.4	24.9
Planed wood	62.3	12.2
Door jambs	46.4	9.1
Wood furniture	41.9	8.2
MDF moldings	39.1	7.6
Other	195.0	38.0
Total	**512.0**	100.0
Japan		
Eucalyptus wood chips	148.1	53.9
Sawnwood	48.4	17.6
Bleached pulp	37.5	13.7
MDF panels	6.0	2.2
Other	34.5	12.6
Total	**274.7**	100.0
China		
Bleached pulp	176.8	73.4
Raw pulp	57.6	23.9
Sawnwood	3.5	1.5
Planed wood	2.3	0.9
Other	0.9	0.3
Total	**241.0**	100.0
Mexico		
Plywood	17.1	18.1
Sawnwood	16.9	17.9
Planed wood	15.0	15.9
Paperboard	10.3	10.8
Other	35.3	37.3
Total	**94.6**	100.0

Source: Instituto Forestal, 2002.

The relationship between the value of imports and the value of exports of wood products has changed during the past decade. In 1990 for each dollar of wood products imported, Chile exported $6.9. In 2001 this had decreased to $4.1. The trend is more noticeable in the value-added sector, particularly wood furniture. In 1990 for each dollar imported, $11.8 were exported. This has dropped to $2 in 2001 reflecting increase purchasing power in the country and generally depressed global prices for forest products (graph 5.6.4).

5.7 Certified forest products

Some progress has been made to develop a national standard of sustainable forest management, primarily for the native hardwood forests. Efforts have been compatible with both the Forest Stewardship Council and Sustainable Forestry Initiative programme.

Commencing five years ago a few Chilean forest companies, reacting to market conditions, began the process that would result in the certification of their plantation forests. As of January 2002, nine forest companies and two wood-processing firms have obtained ISO 14001 certification. Slightly over one million hectares have been certified. By the end of 2002 it is forecast that an additional four companies will have secured certification on an additional 51 thousand hectares of plantations. This will represent approximately 60% of the country's plantation forests.

At this time five companies have obtained chain of custody certification and the right to use eco-labels on their products. FSC is at this time the preferred chain of custody certification.

During the past ten years a few foreign citizens and companies have purchased significant parcels of native forestlands located in the southern regions of the country. One investor has assembled a block that covers an area of over 360,000 hectares that spans the width of the country. It is the owner's professed desire to retain this area in its pristine condition and prohibit any form of farming, road construction, installation of electricity generating plants or other forms of development on the land that he controls or the adjacent waters.

TABLE 5.6.3

Wood products imports, 1990 – 2001

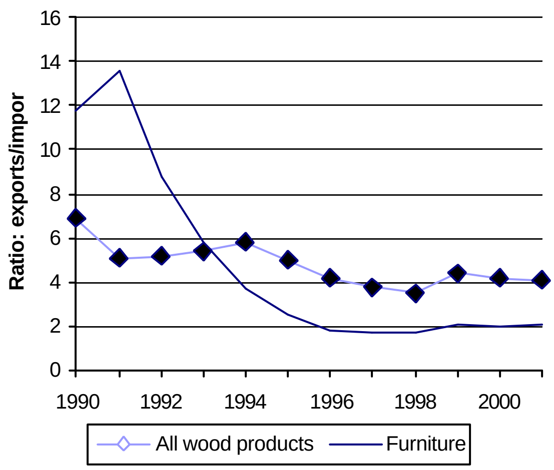
(Million $)

Year	*Paper and paperboard products*	*Wood and wood products*	*Cork and cork products*	*Furniture and furniture parts*	*Cellulose*	*Total*
1990	109.2	6.4	5.3	1.0	2.7	124.7
1991	161.9	7.0	7.1	1.6	2.3	180.1
1992	196.1	10.0	10.0	2.7	0.8	220.0
1993	194.9	17.0	9.8	5.3	0.7	228.3
1994	235.5	17.8	8.9	9.4	1.6	274.1
1995	407.3	27.5	12.3	13.3	9.5	471.3
1996	342.0	36.3	17.9	21.0	3.0	422.1
1997	392.1	50.1	24.5	33.2	3.7	505.4
1998	385.1	51.6	27.5	33.7	4.6	503.9
1999	338.9	39.7	29.1	23.6	7.2	439.9
2000	411.5	56.2	29.3	25.9	17.7	542.2
2001	393.6	67.2	31.2	22.8	19.5	536.3

Source: Central Bank of Chile, 2002.

GRAPH 5.6.4

Relationship of wood product imports to exports in Chile, 1990-2001



Note: $ exported per $ imported
Source: Instituto Forestal, 2002.

5.8 Prospects for the future of the Chilean wood industry

Experimentation with fast-growing introduced hardwoods, primarily eucalyptus, has borne positive results. There is a growing trend towards the establishment of plantations that could outperform radiata pine and provide the industry with an increased volume of high quality fibre as well as saw or veneer logs within 14 years of plantation establishment.

There are two trends points worth noting, particularly among the larger forest product companies in Chile. First, the level of horizontal integration is high, from nursery operations, harvesting, log merchandizing, sawmilling, value-added manufacturing and through to marketing and sales. Second, there has been a large investment in technology in all aspects of their operations, substituting capital for increasing labour costs. Both of these trends can be expected to continue.

Another significant trend warranting observation is the investment that Chilean forest companies have made in other Latin American countries. The recent signing of various free trade agreements with Central American countries, including Costa Rica, has resulted in the establishment of offices in some of these countries to direct market Chilean wood products. The free trade agreement signed with Mexico has resulted in a strategic alliance entered into by Terranova Internacional with Maderas y Sintéticos de México (an affiliate of the Chilean company Masisa) to form Masnova de México. Masnova will market Chilean MDF products. Muebles Sur S.A., a Chilean furniture manufacturer, in 2001 opened a retail outlet in Mexico to direct market its products.

In 2001 Masisa purchased MacMillan Guadiana, a Mexican waferboard manufacturer and affiliate of Weyerhaeuser, and started up an OSB plant in Brazil. In that same year the Terranova Group purchased a large acreage of plantation forests in Brazil and Venezuela, investments that totalled approximately $40 million. Terranova has now purchased Masisa for $150 million.

The Arauco Group has a large investment portfolio in Argentina that includes MDF plants that, when combined with their plants in Chile, gives this company an annual production capacity of over one million m^3 situating it as a significant global producer.

5.9 Conclusion

Chile has clearly proven itself to be a fibre supply success story. Through past incentives to establish impressive plantations, Chile has all but eliminated its reliance on native forests. Moreover, from resource to international markets, the Chilean wood products industry has implemented a supply chain management scheme that could be a model for any country. It can be expected that Chile will continue to grow in importance as a world wood products supplier, contributing to the global trend of an increased reliance on southern hemisphere plantations.

5.10 References

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