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**ANALYSIS OF THE CHILEAN
FORESTRY ECONOMY**



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INTRODUCTION

The "Forestry Census 1980" has been carried out with the combined efforts of the "National Forestry Corporation" and the "Forestry Institute". Its realization makes it possible to assess in real terms the actual dimension and evolution of the Chilean Forestry Sector.

The updated data of the sector provides the elements to make an analysis oriented towards the description of the evolution of forestry activities. The conclusions stemming therefrom indicate that the sector experienced a slow growth rate during the 60's, with a rate twice as fast during the 70's. As from 1975, its growth rate exceeds the average growth rate of the national economy, becoming an important factor in the economic development of the nation.

The main purpose of this report is to analyze the results. A similar report, descriptive in character, summarizes the detailed results of the statistical yearbook of the forestry sector, complementing this one.

1. FOREST PRODUCTION

Both the behavior of felling and the production of the primary manufacturing industry are relevant elements in assigning real figures to the growth of the Chilean forestry sector.

The historical series of both these indicators establishes, in general terms and in physical units, that every ten years the felled volume is doubled and industrial production, represented basically by sawmills and pulp plants, has tripled within the last decade.

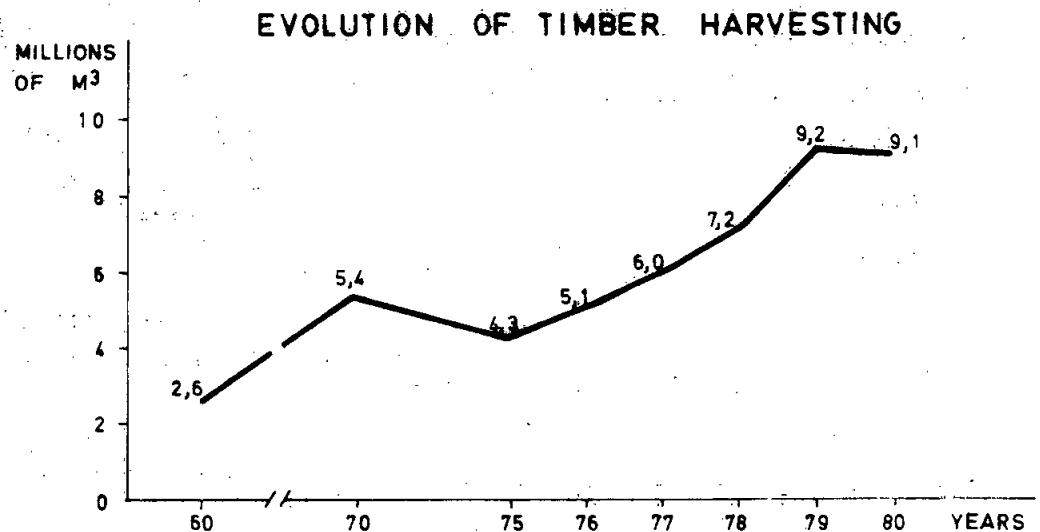
These two elements are complementary to each other, without a 1:1 correlation, due to aspects related to the productivity of wood as a raw material. These indicators, together with other ones such as Exports, Transportation and Product Value, make it possible to appraise thoroughly the evolution of the forest activities in the nation.

It is readily evident that the growth rate of the sector reaches its highest values during the last four years. In 1980, however, its value decreases, making it a constant year with respect to the preceding one.

1.1 Felling

The evolution of logging operations has been a good indicator of the growth of forest activities.

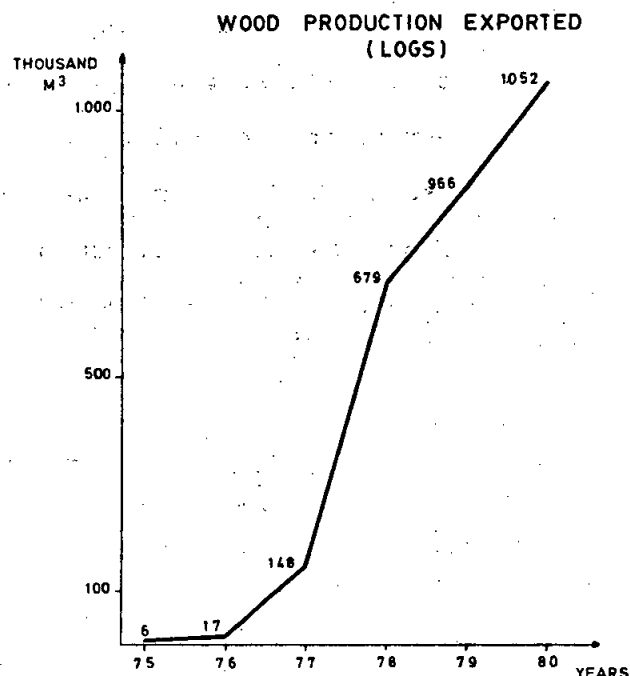
In 1960, felling operations amounted to 2,6 million cubic meters, growing during the decade at an accumulative annual rate of 6.8%. During the 70's, the growth rate increased to 8.2% a year, basically due to the outstanding increase from 1976 on. Between 1977 and 1980, felling operations grew at a rate of 14.8% a year.



In 1980 felling activities remained at a constant level with respect to the previous year, some 9.1 million cubic meters, representing about 20,000 has. exploited.

The lack of growth in felling activities during 1980 did not imply a slowdown on the activities of the forest sector. Greater productivity and reorganization of production, as will be seen further on, increased both exports and product value of the sector; these two indicators are the more significant ones to explain the positive development of that year.

The DESTINATION of the production of wood is both the home market, to supply the primary manufacturing industry, and the foreign markets. The item "Export Logs" has been the most dynamic one, becoming significant only in 1976 and rating third in importance in 1980, after cellulose and sawnwood, in demand of wood, in exports and in transportation.



91% of the wood produced in Chile comes from plantations of Radiata pine (Pinus radiata D. Don).

Supply and Demand of Logs

Three items take up 92% of the wood produced: sawmills, 50%; Cellulose, 31%; and Export Logs 11%. The latter has been the fastest growing item these last few years. The remaining primary manufacturing activities are not considered here.

RELATIVE CONSUMPTION OF RAW MATERIAL (WOOD) 1980

Sawmills	50 %
Cellulose	31 %
Export Logs	11 %
Newsprint	3 %

As an individual product, cellulose is the largest consumer of raw material, with 5.1 m^3 of logs to produce 1 ton of chemical pulp. Next is sawn lumber with 3.5 m^3 and then export logs with 1.1 m^3 , to produce the same ton.

The higher the input-output ratio (from log to product), the smaller the demand of transportation and of indirect labor. For example, import logs mobilize one million tons in a supply area of over 200 Km. in diameter, requiring large port services and international freights. Cellulose plants, in turn, are supplied with the same million tons from a supply area inferior to 100 km. in radius, but the output amounts to only 200,000 tons, with port requirements five times smaller than in the previous case.

The supply of raw material, from the point of view of availability of the resource, has been no obstacle to forest development. At the time when the price of logs made the activity profitable, the limitations to growth were centered rather in aspects of production, road and port infrastructure, than in availability of forests.

On the other hand, the price factor made it commercial to engage in thinning and chip production activities, bringing supply up immediately without increasing final harvest of forests. The size of this raw material ranks below 10% of the total wood extracted, but obviously with great possibilities of increasing. This fact makes felling a limited indicator of growth.

The boom in exports of forest products has spurred mechanization of logging operations. Forest exploitation has seen remarkable technological improvements, at present stressing process speed rather than lowering of costs.

The dynamism of this factor has made it possible to increase roadside timber supply, representing the economic supply of the sector. This leaves growing stock as the only technical indicator.

Felling-Growth Balance

One of the approaches to determine whether felling is being carried out in too large or too small a scale, relates volumetric accretion to extraction, and concludes that felling levels exceed forest growth by no less than 14%. We would then have and impoverishment of the resource. This is not a really sound approach, as it does not take into account the volumetric accretion of new plantations, themselves representing a sizable capitalization in area. From the point of view of felling only what was planted one rotation ago, it is again found that, as an average, felling exceeds its presupposed volume.

According to the present economic scheme, the market itself is to be the regulator of wood supply, i.e., of felling. Different studies indicate that felling levels will be unable to grow at high rates during this decade. Therefore, the development of the activities in the sector shall depend on improving productivity (increasing volume of thinning operations, greater recuperability of chips, etc.).

The simplest balance, which states that 20,000 has. were felled in 1980, against 72,000 has. of new plantations in the same period, shows a great physical potential for expanding the activity during the next rotation, 20 years hence.

Finally, taking into consideration the enormous availability of soils apt for forestry, the level of afforestation seems rather conservative.

More accurate conclusions will only be obtained through in-depth studies based on recent data.

1.2 Primary Industry. Analysis By Trade

According to the Model of Classification of Forest Activities (1), primary manufacturing activities consist of those transformative activities whose basic raw material is directly related to forest exploitation. The term applies essentially to the plants whose main input is logs, such as those producing pulp, newsprint, boards and veneers, and sawnwood.

The relative importance of each of these industries can only be established from the analysis of certain variables, such as production value, wood consumption, income contribution, and others.

INDUSTRIES	SHARE IN %		
	PRODUCTION VALUE	WOOD CONSUMPTION	VALUE OF EXPORTS
Cellulose	38,2	31,0	42,0
Sawnwood	36,8	50,0	32,0
Boards	8,8	2,4	1,5
Newsprint	7,9	2,8	6,6
(Export Logs)	(7,3)	(11,6)	(12,0)

(1) CAEF.

The table shows that cellulose and sawn lumber industries have nearly equal importance. They constitute the core of the Chilean forest production, and are based on practically one single species, Radiata pine.

Export logs were included on purpose in the above table, and it may be seen that they are practically more important than the Board and Newsprint Industries.

While cellulose production is in the hands of only two firms, the sawmills are owned by nearly 1,400 different proprietors.

The DESTINATION of Forest Production in physical units is:

Sawnwood	59% exported
Cellulose	66% exported
Newsprint	50% exported
Boards & Veneers	31% exported
Logs	12% exported

In summary, 60% of primary production is exported, evidencing the fact that the forest sector is oriented towards the international markets.

A) Woodpulp; Papers and Cardboards

This is the main forest activity in the nation, accounting for 38% of the total value; it takes up 31% of wood production and generates 42% of the income in the sector.

The final products of this industry are celluloses, papers and cardboards which, in turn, become the input to secondary manufacturing concerns, such as those producing cardboard containers, packing materials, wall papers, printed material, etc.

Production

This item is represented mainly by chemical pulp or cellulose.

The production series for these last 20 years shows an 11% yearly increment both in the 60's and in the 70's; this is equivalent to nearly trebling every ten years.

The exportable surplus has followed a nearly identical tendency. During the last decade the export tonnage rose from 105,000 tons to 414,000 tons, remaining at that level since 1978.

In 1980 cellulose was practically the only item in the Primary Manufacturing Activity that increased the volume of its production.

The higher level of 632,000 tons, as compared with 570,000 tons the previous year, is explained by the production increment in Celulosa Constitución. The exportable surplus decreased by 4% in the same period, on account of greater demand in the home market. Internal demand has been rising steadily since 1979, consequent with the faster pace of national development.

The VARIATION of production, as compared with 1979, was:

Pulp (in general)	+ 8,9 %
Cellulose	+ 11,3 %
Bleached	+ 8,1 %
Semibleached	- 6,6 %
Crude	+ 23,1 %
Newsprint	- 2,8 %
Cards (for computers)	- 53,0 %

The production of cellulose is in the hands of two firms (C.M.P.C. and Celulosa Arauco y Constitución), with 3 plants. INFORSA and C.M.P.C. lead the production of papers and cardboards, with 5 plants.

This fact, in itself a rather monopsonic market imperfection as regards pulpwood acquisition in different areas, as well as a monopolic one as regards paper sales in the country, has been offset thanks to the ample opening towards the international markets of both forest products and raw materials, encouraged by the Government.

On the other hand, in a developing country this type of industry constitutes an all but prohibitive investment value for small or medium sized investors.

MECHANICAL PULP, used in the production of paper and perforated card stock, has a slow growth rate. Newsprint production is at the 1970 level, and the production of other papers is slightly higher than 1972 levels. Production of these items has normally been variable.

The fact that these factories are highly intensive in capital causes growth to be observed only in discreet stretches in determined years, corresponding to the enlargement of factories or the setting up of new ones. In general, there are enlargement plans for existing plants, and there is a project for a new factory. This shows it to be an economically attractive activity with a positive tendency in its production.

As regards INSTALLED CAPACITY, cellulose production in 1980 was above designed capacity (603,000 tons), observing this peculiar efficiency above most of the national industry. Newsprint was slightly below its installed capacity (147,000 tons), on account of the expansion of INFORSA.

The industrial EMPLOYMENT LEVEL is 2,955 persons in the permanent payroll, rising to approximately 4,422 persons if forest exploitation and log transportation activities are included.

B) Sawmills

The sawnwood industry ranks as the second activity in importance in the sector, next to pulps.

This item represents 37% of the forest production value; it takes up 50% of wood production and contributes with 32% of income in the sector.

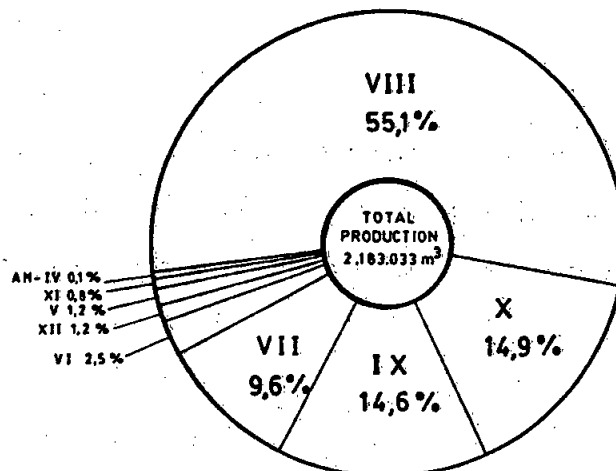
The relevance of this sector lies in the flexibility of its production function, being able to produce with highly capital intensive facilities and little labor, or viceversa.

The fact favors greatly a balanced regional development, as it utilizes the factors according to their relative scarcity.

This is backed up by the fact that the main producer of sawn lumber in Chile, MADESAL (circa 105,000 m³), operates 19 low investment mills, and the second producer, Forestal Arauco, with some 97,000 m³, has 3 high-investment mills. INFORSA is expected to move up to the first place with its single highly capital intensive facility, with a designed annual capacity of around 170,000 m³.

SAWNWOOD PRODUCTION BY REGIONS

1980



There are 1,498 sawmills in Chile, widely spread throughout the country, from the IV Region in the North, down to the XII Region, at the Southern tip of the continent. This fact makes it difficult to obtain serialized yearly statistics of production and of characterization of the activity. The 1980 Census makes it possible to determine the size of this industry, reported in detail in a paper parallel to this one, with a nearly total coverage. The results represent the actual level of national production, with the limitation imposed by the lack of similar works since 1974.

Evolution

Sawmills produced 780,000 m³ in 1962, with a rising cyclic tendency. During the 60's, the industry experienced slow growth, at an accumulative yearly rate of 2.9%, representing an increment of nearly 200,000 m³ during that period.

During the 70's it grew at a yearly rate of 8.3%, doubling the volume of its production and reaching 2.18 million m³ in 1980.

This activity experienced its most dynamic growth between 1975, when it had been affected by a heavy slump in production, and 1979, rising from one to two million m³.

In 1980 production remained static, compared to the preceding year, as a consequence of a drop in external demand which started with the second semester of that year. Moreover, nearing the end of the year, the large existing stocks brought about a price downfall.

As the market situation approaches normality, the increase in production will attain significance, especially as several big sawmills (INFORSA, Cementos Bío-Bío, Carampangue, Urrizola and others) started operations in 1980, raising the national production capacity to nearly 3.6 million m³.

The greater part of sawnwood production is based on Radiata pine, 84% of the total, and 2% on Eucalyptus, Poplar and Cypress. The remaining 14% comes from native woods, some 300,000 m³. This is only half as much as was produced from native woods twenty years ago.

This fact evidences once again the small chance of development of native wood activities, at least in the near future. Many sizable projects in direct relation with native woods have been postponed, such as Asti-Chiloé; Cel-Panguipulli; Sarao, and others.

As a direct consequence of this fact, the activity has shifted towards the zones with Radiata pine plantations.

Destination of Production

The national production has normally had an exportable surplus, which in 1980 reached 59.3% of the total. In 1970, it amounted to 40%, in physical units.

Internal consumption has grown at a rate of 3.3% annually during the decade which ended in 1979, but in 1980 the apparent internal consumption dropped to the 1971 levels, equivalent to about 880,000 m³.

This is contradictory with the increase in construction activities, and may be explained by a stock adjustment, or simply by the fact that new constructions have required a smaller percentage of sawn lumber, shifting to other wood-based materials.

Therefore, the permanent increase in production has been exported; thence export and production figures show a similar growth rate.

Sawnwood exports in 1980 increased 20% in volume and 61% in value. This higher price was the decisive factor in the increase of the exported volume.

Employment and Geographical Distribution

The productive activities in the country are concentrated in the areas with Radiata pine plantations, on account of the concentration of commercial volume per area unit, and accessibility.

In direct relation with the foregoing fact is the distribution and participation of labor, the differences of which lie in the technological levels achieved.

The amount of labor in sawmills reaches its highest levels between October and April, with nearly 18,000 persons, without taking logging operations into account.

The following table relates the share of the main Regions in the production of sawnwood, with their share in labor. The differences in their correlation are the indicators of capital intensity, technological level and efficiency of the plants located in each Region, showing that farther South, a higher amount of labor is required.

REGION	SHARE IN	SHARE IN
	PRODUCTION (%)	EMPLOYMENT (%)
VII	9,6	7,2
VIII	55,1	40,2
IX	14,6	20,7
X	14,8	23,4

The main features that represent the technological structure of the sawmills, are the power source and the type of Head Saw or Main Saw.

As regards power source, steam engines head the list with 47%, although they turn out only 15% of the total production. These are the same old machines of long ago and are found exclusively at the small and very small mills.

TYPE OF POWER	% OF TOTAL AMOUNT OF MILLS	SHARE IN PRODUCTION (%)
Electric	8,7 %	49,2 %
Diesel	40,4 %	35,1 %
Steam	46,9 %	14,6 %
Gasoline	1,0 %	1,1 %
Other	3,0 %	1,0 %

As regards the Main Saw or Head Saw, 95% of the mills (which, in turn, produce 73% of the total), utilize a circular saw with detachable teeth.

TYPE OF SAW	% OF TOTAL AMOUNT OF MILLS	SHARE IN PRODUCTION (%)
Circular Saw	94,9	72,8
Band saw	2,7	18,4
Frame saw	10,5	8,3
Others	1,8	0,5

These two elements show the impact of the energy crisis, on the one hand in the search of cheaper sources of energy, and on the other in the avoidance of high loss of wood in the sawing process, seeking technological innovations to improve productivity.

There is a moderate capacity for artificial drying, of around 500,000 m³ a year, in three turns. In 1980 only 9% of the production sold was dried. It is therefore possible to meet higher demands, if the clients should so request.

C) Board and Veneer Industry

Boards and veneers have experienced slow development. Their present relative importance amounts to 8.8% of the forest product value, 1.46% in income contribution and 2.4% in wood consumption.

During the last decade fiberboards and particleboards doubled their production, to 43,000 tons and 30,000 tons respectively, resulting from enlargements in the existing plants within the second half of that period. Plywood and veneers are presently at the 1970 levels.

In 1980 only fiberboard production rose, however slightly (3.6%); the remaining boards stayed at the same level. A 100% increase in particleboard production is expected in 1981, thanks to the 79-80 enlargement of the Chiguayante plant of MASISA. There are no new projects being now under execution.

It has been possible to characterize this manufacturing activity thanks to the small number of factories involved: 1 producing fiberboards; 3 producing particleboards; 2 producing veneers and 4, plywood. The following table describes type of production in 1980.

BOARDS AND VENEERS (1)

REGION	FIRM	FIBER- BOARDS	VENEERS	PLYWOOD	COMPOSITE PANELS	PARTICLE- BOARDS
VII	CHOLGUAN	X	-	-	-	-
VIII	MASISA	-	-	-	-	X
IX	FOCURA	-	-	-	X	X
X	INFODEMA	-	X	X	X	-
X	LAMINADORA	-	X	X	X	-
X	EMASIL	-	-	X	X	-
X	PELLAIFA	-	-	X	X	-
X	MASISA	-	-	-	-	X

DESTINATION of board production. In 1980, 62% of fiberboard production and nearly 50% of that of veneers was exported. The rest was placed in the home market.

The increased production of both Cholgúan and MASISA has confirmed the existence of economically attractive home and foreign markets. This once again shows that the fastest growing manufacturing activities are those based on Radiata pine. As far as veneers and boards based on

(1) It does not include boards to be consumed by the firm itself.

native species are concerned, there are no projects at the moment. The veneer processors have replaced native wood as their raw material in a proportion of 50%, for eucalyptus, oak and chestnut.

Only Cholgúan and the veneer industries have produced at the top of their installed capacities. The rest has shown a considerable idle capacity: 30% in plywood; 50% in composite panels and 54% in particle-boards. The latter is due to the start up of the enlargement of the MASISA plant and not to a lack of markets.

As regards employment, the labor force amounts to 2,130 persons around the year, at the industrial stage.

1.3 VALUE OF FOREST PRODUCTION

The value of the Primary Forest Production, in market prices, placed at the plant for internal consumption and FOB price for the exported portion, shows a 48% yearly increase in real values in 1978 and 1979, and 22% in 1980, compared with the preceding year.

This important increase in the value of production reflects both the increase in production and the higher prices, the latter being a basic element to explain what happened between 1979 and 1980.

ITEMS

Rated according to their relative importance in 1980, pulps rank first -especially cellulose-, with nearly 38%; next is sawnwood with a very similar share of the total, 37%. As regards growth rates in the last three years, the most dynamic items have been export logs, with 118%, and sawnwood with 89%.

It is interesting to note that, in spite of an investment value four times as big for pulp production as for sawnwood production, they share a very similar position in the value of production in Chile. As there are no conclusive studies on the matter, nor elements related to their profitability, it can only be stated that the investment in sawmills "yields" nearly four times as much as in pulp production. The existence of the latter can only be explained in light of their profit margin.

The foregoing figures confirm as well that an element with no added value, as export logs, contributes, among other things, with a significant share (56.8 million dollars) of the National Product.

The value of plantations (from 0 to 11 years based on reposi-
tion cost and up from 12 years based on market value), amounts to 901
million dollars. Therefore, the value of the industrial establishment
plus plantations amounts to 1,645.2 million dollars.

An estimate of the participation of the forestry sector in the
national economy can be made on the basis of the value of forestry
production, 782.4 million dollars, against the product between the per
capita income and the population (Gross Geog. Product). The participa-
tion of the sector is about three per cent.

VALUATION OF PRIMARY FOREST PRODUCTION
(1978 - 1980)

PRODUCTS	1978	1979	1980
Logs	26.058.452,8	34.755.375,9	56.835.090,0
Sawnwood	135.622.440,9	250.042.856,3	287.890.830,8
Boards & Veneers	41.648.461,6	57.221.624,5	68.889.117,7
Woodpulp	177.232.760,4	245.274.001,0	299.338.234,1
Newsprint	53.880.995,2	56.312.402,3	61.870.899,5
Other	9.057.816,4	7.215.637,0	7.593.638,0
T O T A L	438.500.927,3	650.821.897,6	782.417.810,1

INVESTMENT VALUE VERSUS PRODUCTION VALUE

(thousand US\$)

	Investment	Production	Production/Investment
	Value	Value	Ratio
Woodpulp	500.000,0	299.338 38,3	0,59
Sawnwood	112.231,3	287.890 36,8	2,5
Boards & Veneers	32.000,0	68.889 8,8	2,1
Newsprint	100.000,0	61.870 7,9	0,61
Other production	-	7.593 0,9	-
Forests	-	- -	-
Export logs	-	3.973 0,5	-
Plantations	901.000,0	- -	-
Export logs	-	52.861 6,8	-
	1.645.231,3	782.417 100,0	

The relationship between the monetary investment unit at present value and the generated value in a given area, may be determined from the above table. It may be seen that:

- Sawmills : each dollar invested generated 2.5 dollars in production value.
- Boards & Veneers : each dollar invested generated 2.1 dollars in production value.
- Newsprint : each dollar invested generated 0.69 dollars in production value.
- Cellulose : each dollar invested generated 0.69 dollars in production value.

The obvious conclusion is that the sawmill industry is the least capital intensive industry, as compared with the rest.

2. FOREST PRODUCT TRADE AND RELATED SERVICES

2.1 Product Market

Forest Industries were formerly geared towards the supplying of the home markets. The opening of the markets and the internal contraction in construction (main consumer of sawnwood in the home market, with nearly 50% of the total) brought about a change in the marketing activities, now more oriented toward exports. Currently, 60% of the value of forest production goes abroad.

In the early 70's sawnwood exports took up 15% of production ($150,000 \text{ m}^3$). In 1980, the proportion rose to 59% of total production. Apparent consumption during the period experienced very slow growth, from $830,000 \text{ m}^3$ in 1970 to $883,000 \text{ m}^3$ in 1980.

Insofar as cellulose and paper are concerned, exports percentages have been nearly identical throughout the decade. In 1980, 66% of cellulose production and 50% of Newsprint production went abroad. This industry was geared from the outset towards the overseas markets, in view of the enormous demand for fibrous products from conifers as raw materials for paper manufacturing.

Logs started being exported in 1975, reaching 12% of industrial wood production in 1980.

APPARENT CONSUMPTION
1970 - 1980

YEAR	SAWNWOOD (1,000 m ³)				LOGS FOR INDUSTRIAL CONSUMPTION				CELLULOSE (ton)				NEWSPRINT (ton)			
	PRODUC.	EXPORT.	IMPORT.	C. A.	PRODUC.	EXPORT.	IMPORT.	C. A.	PRODUC.	EXPORT.	IMPORT.	C. A.	PRODUC.	EXPORT.	IMPORT.	C. A.
1970	976	150	4	830	5.368	-	-	5.368	210.700	105.298	-	105.402	124.409	78.271	1.000	47.138
1973	1.032	67	1	966	5.603	-	5	5.608	241.997	97.256	13.000	157.741	105.089	32.713	-	72.376
1974	1.399	133	-	1.266	5.215	-	17	5.232	313.801	179.242	3.000	137.559	118.231	77.489	-	40.742
1975	960	257	-	703	4.300	6	-	4.294	325.802	174.812	-	150.990	119.713	78.266	-	41.447
1976	1.223	413	-	810	5.100	17	-	5.083	390.000	283.488	-	106.512	133.028	92.818	-	40.110
1977	1.336	684	-	652	6.009	148	-	5.861	474.000	338.078	-	135.922	132.248	87.395	-	44.853
1978	1.475	795	-	680	7.175	679	-	6.496	535.556	436.894	-	98.662	131.923	76.877	-	55.246
1979	2.198	1.081	-	1.115	9.186	966	-	8.220	570.481	431.157	-	139.324	134.430	75.460	-	58.970
1980	2.183	1.295	-	888	9.102	1.052	-	8.050	631.999	414.784	-	217.215	130.973	65.376	-	65.597

Prices of Forest Products

The value of land apt for forestry varies from 100 to 200 US\$/ha. in the zone recommended for plantations.

The increase in the productive activity has generated a strong pressure on plantations, raising the price of raw materials. Pulpwood placed roadside was traded at:

1970 3,24 US\$/m³

1976 5,32 US\$/m³

1980 7,93 US\$/m³

This represents a 145% increase in real value for the decade.

The value for the same wood placed at the factory reached an average of 12.40 US\$/m³ in 1980. This higher price, together with the greater elasticity in a price "placed at the plant" has encouraged the production of forests, as the forester is able to absorb the location costs.

As regards saw logs placed at the plant, the price has likewise increased during the 70's. In 1980 the average price was 24 US\$/m³, whereas in 1975 it remained below 12 US\$/m³. This increase has been proportional with the increase in log shipments, as they are similar products. The average price of export logs was 52.7 US\$/m³ FOB in 1980.

All these incentives encourage the producer of forests to carry out reforestation projects which, together with the D.L. 701, increase substantially the planted area.

Radiata pine sawnwood placed at the mill was traded in 1970 at an average price of 36.20 US\$/m³. In 1980 the price reached 76.20 US\$/m³, increasing 2.1 times over the decade. The average export price of sawnwood of the same species was 117,4 US\$/m³ in 1970, receding to 109,7 US\$/m³ in 1980, i.e., a decrease of 6.6% over the 10-year period. All these prices have been adjusted according to the Consumer Price Index of the USA.

PRICES OF RADIATA PINE PRODUCTS IN REAL
VALUE (US\$ 1980 CPI U.S.A.)

US\$/m³

PRODUCTS	1970	1976	1980
Logs			
For Pulp	3,24	6,04	7,93
Base 1970	100,00	186,41	249,75
For Export	-	55,30	52,7
Base 1976	-	100,00	95,29
Sawnwood			
Placed at Mill	36,20	36,8	76,2
Base 1970	100,00	101,7	210,5
For Export	117,4	79,9	109,7
Base 1970	100,0	68,1	93,4

Native woods placed at lumber yards reached the following average prices in 1980 (US\$/m³):

	Cut to Size	Finished
Coigue	199,2	255,4
Raulí	439,2	471,8
Roble	188,2	225,1

Internal market prices of other products, in the same year, were as follows:

Fiberboards	395 US\$/ton
Particleboards	825 US\$/ton
Bleached Pulp	338 US\$/ton
Semibleached Pulp	372 US\$/ton
Crude Pulp	300 US\$/ton
Newsprint	322 US\$/ton

The examination of the tendencies followed by the prices of the major products shows that in 1979 a similar positive trend is achieved between the evolution of home market and export market prices. However, only sawnwood prices have come near the expected evenness between both markets. Pulp products are exported at prices 40% higher than the internal market prices. Only boards are exported at prices significantly smaller.

International Trade

During the 60's forestry exports accounted for 2.6%, as an average, of the total exported by the country. Between 1970 and 1973, their share rose to 3.6%. The years following 1974 saw an important increase in this participation, with forestry activities becoming a sizable contributor to the national income. The activity, as an average, accounted for 8.4% of the total exported during the period from 1974 to 1980, with 9.7% during the last year.

EVOLUTION OF THE SHARE OF FORESTRY EXPORTS IN THE TOTAL EXPORTS OF THE COUNTRY

Period	Share %
1960's	2.6
1970's	7.3
1976	8.5
1977	8.7
1978	9.5
1979	9.3
1980	9.7

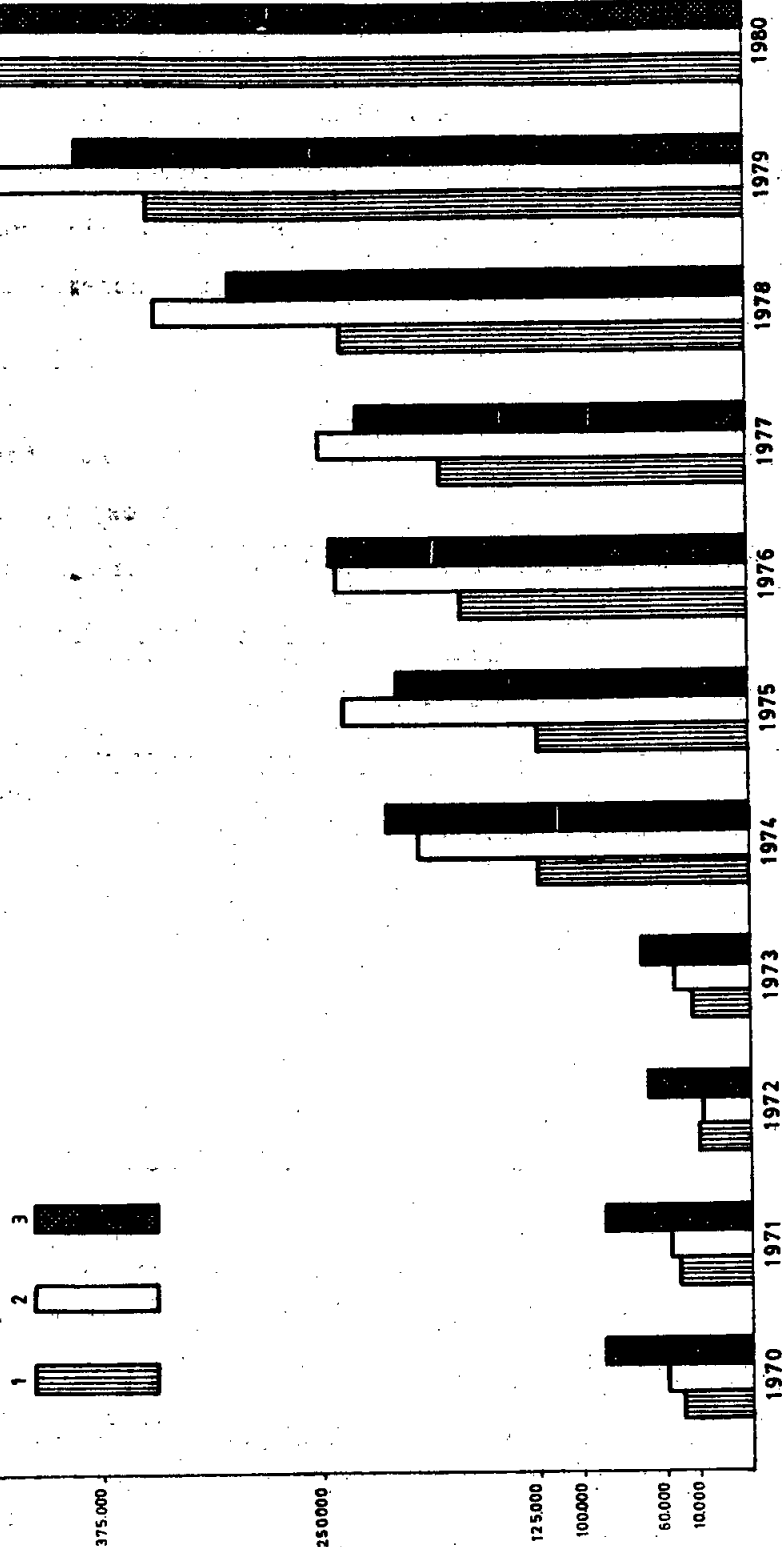
The growth rate, expressed in real terms as adjusted to the CPI in USA, shows that forestry exports from 1970 to 1980 rose at an accumulative yearly rate of 18%. Taking the Chilean CPI into account and expressed in dollars for each year, the growth rate amounts to an accumulative 24.6% a year.

Within the last three years the accumulative real growth accelerates, as per CPI USA.

THOUSAND
US \$

FORESTRY EXPORTS IN REAL AND NOMINAL TERMS

(Thousand US \$)



(1) No adjustment. Expressed in dollars for each year.

(2) & (3) Adjusted according to:

CPI Chile and expressed in dollars for each year according to prevailing exchange rate.

(3) CPI USA.

YEAR	US \$ NOMINAL (1)	US \$ REAL (2)	US \$ REAL (3)
1970	41.700,0	88.487,4	51.830,4
1971	42.500,0	86.470,5	47.261,6
1972	31.600,0	62.242,5	31.041,7
1973	36.400,0	67.692,9	44.887,0
1974	12.700,0	21.221,0	19.447,0
1975	12.554,2	19.220,1	23.897,7
1976	16.912,9	24.790,9	24.229,9
1977	18.058,4	24.523,3	25.182,5
1978	23.687,4	29.196,3	34.741,7
1979	34.930,1	38.931,0	45.104,1
1980	46.805,4	46.805,4	46.805,4

The positive evolution of the share of the forestry sector in total exports has been fueled by the replacement of a closed up economy for a market economy, whose main characteristic is an opening towards international trade. Among the major achievements is the conquest of new markets, diversification of exported products and increase in investments in the sector.

As regards future prospects of world market for forest products, a number of studies carried out by different experts reveal an ever increasing demand of forest products, while the forest resource is dwindling throughout the globe. A few revealing figures follow:

- World production of logs in 1978 exceeded 2,600 million m³, with a deficit -or imported portion- of 91.6 million m³. The figures show a sizable deficit in the world markets, indicating a great potential for log exports. Chile exported only one million cubic meters of logs in 1980.

- Sawnwood: World production in 1978 amounted to 440.5 million m³, 60.6 million m³ were acquired in the world markets. Undoubtedly, there is a considerable market for sawnwood. Chile exported only 1.3 million m³ in 1980.

- Woodpulp: World production in 1978 amounted to 117.8 million tons. World purchases in the same year reached 13.8 million tons.

- Newsprint: World production in 1978 amounted to 117.5 million tons, with a deficit of 11.3 million tons.

The fact that the existing world market for forest products greatly exceeds the levels of Chilean production, added to the pattern of price evolution provides excellent encouragement to the development of the activity.

Concentration - Diversity

The diversity of exports is expressed in terms of the number of client countries, the amount of exporting concerns and the types of products. At present, the figures are 49, 352 and 80, respectively. The vastness of the world market is another important factor.

The foregoing considerations indicate that the only limitations of the exporting activity lie in productive and financial efficiency.

Nevertheless, forestry activities are still concentrated:

- 72 % of the value of shipments was sold by seven companies.
- 75 % of the value was bought by three countries.
- 83 % of the value comes from the sales of 4 products.

74.6 % of the value of shipments in 1980 (i.e., 349.1 million dollars) went to 9 countries.. Argentina remains as the main buyer, with 98.2 million dollars, or 21.0%; next is Korea with 35.7 million dollars, or 7.6 %. The number of client countries increased from 47 in 1979 to

49 in 1980. The relative share of the major countries has kept a similar structure during the last three years.

DISTRIBUTION OF THE VALUE OF SHIPMENTS TO MAJOR CLIENT

COUNTRIES FOR CHILEAN FOREST PRODUCTS (%)

COUNTRIES	1978	1979	1980	1981
				(January - May)
Argentina	20.9	22.5	21.0	25.4
Korea	11.3	9.8	7.6	9.0
Brazil	12.4	12.4	9.3	7.4
China	0.4	3.3	5.8	11.5
West Germany	7.8	6.2	5.3	7.3
Colombia	3.9	3.9	2.9	5.7
Venezuela	11.5	4.2	4.7	5.2
Japan	4.9	4.3	8.4	1.7
Unit Arab Emirates	3.4	2.8	9.6	3.6
Others	23.5	30.6	25.4	23.2
T O T A L	100.0	100.0	100.0	100.0
Thousand US\$	236.8	349.5	468.1	165.0

The evolution of the composition of shipments indicates that pulp has always had a prominent position in exports. Its share in the total exports, however, was only 42.1% in 1980, down from 45% during the three preceding years.

As regards sawnwood, its share in exports has risen steadily over the years. In 1978 it accounted for 20% of the total and in 1980 it increased to 31.8%.

Export logs, as stated previously, has been the most dynamic item: there were no exports in 1974; in 1977 it accounted for less than 2% of the value of shipments, and in 1980 its share rose to 11.3%.

Newsprint, on the other hand, has lost ground during the last few years. In 1977 it accounted for 16.4% of the total value, and in 1980 for only 6.6%.

MAIN PRODUCTS EXPORTED. DISTRIBUTION OF THE VALUE OF SHIPMENTS

(%)

ITEMS	1978	1979	1980	January-May
				1981
Cellulose	45.5	47.6	42.1	49.1
Radiata pine sawnwood	20.0	23.7	31.8	29.3
Radiata pine logs	8.6	8.6	11.3	6.9
Other products	25.9	20.1	17.1	14.7
T O T A L	100.0	100.0	100.0	100.0

As far as exporters are concerned, 7 companies alone exported products for a value of 336.4 million dollars in 1980, with 71.9% of the total value exported. The pattern has remained stable during the last few years. The number of exporters rose from 306 in 1979 to 352 in 1980.

MAIN EXPORTERS. DISTRIBUTION OF THEIR SHARE IN THE

TOTAL VALUE OF EXPORTS

(%)

COMPANIES	January-May		
	1979	1980	1981
Celulosa Arauco y CELCO S.A.	32.3	30.5	37.4
C.M.P.C.	19.7	14.4	15.6
INFORSA	8.0	6.4	6.8
Forestal Arauco	4.8	7.6	4.2
Consorcio Prod. y Exp. de Mad.	-	5.6	3.8
MADESAL	3.5	4.3	2.4
Laja Crown	5.0	3.1	2.3
Other Exporters	26.7	28.1	27.5
T O T A L	100.0	100.0	100.0

Commercial Exchange

As it is not possible to refer to a balance of trade, on the account of insufficient data, we shall be limited to the concept of "commercial exchange" of products. In 1980, imports of forest products amounted to 80.3 million dollars, up from 64.3 millions in 1979 (24.8% increase), comparing the same products. Deducting this figure from the value of forestry exports, there is a positive balance of US\$ 387.8 millions.

IDENTIFIABLE IMPORTS OF FOREST PRODUCTS

(million US\$)

PRODUCTS	1979	1980
Wood, charcoal and manufactured wood products	2.2	4.4
Cork and related products	3.3	2.5
Esparto products and basketry	0.9	1.2
Materials for paper manufacturing	2.1	2.6
Paper and cardboard for paste manufacturing	65.8	69.6
T O T A L	64.3	80.3

2.2 FOREST PRODUCTS TRANSPORTATION. PORTS AND ROADS

Road transportation of forest products, as an indicator of the productive activity of the forestry sector, shows an increase of 21% in 1980, as compared to 1979, and 31% compared to 1978, both figures based on ton-km. The ton-kilometer concept is the most relevant indicator of the flow of transportation, as it relates the transported volume to the distance covered. Statistics for the last three years show a strong preference for road transportation, in place of rail transportation, with 72% of the total transported in 1980 being done by truck.

NATIONAL FOREST PRODUCTS TRANSPORTATION BY ROAD AND RAIL

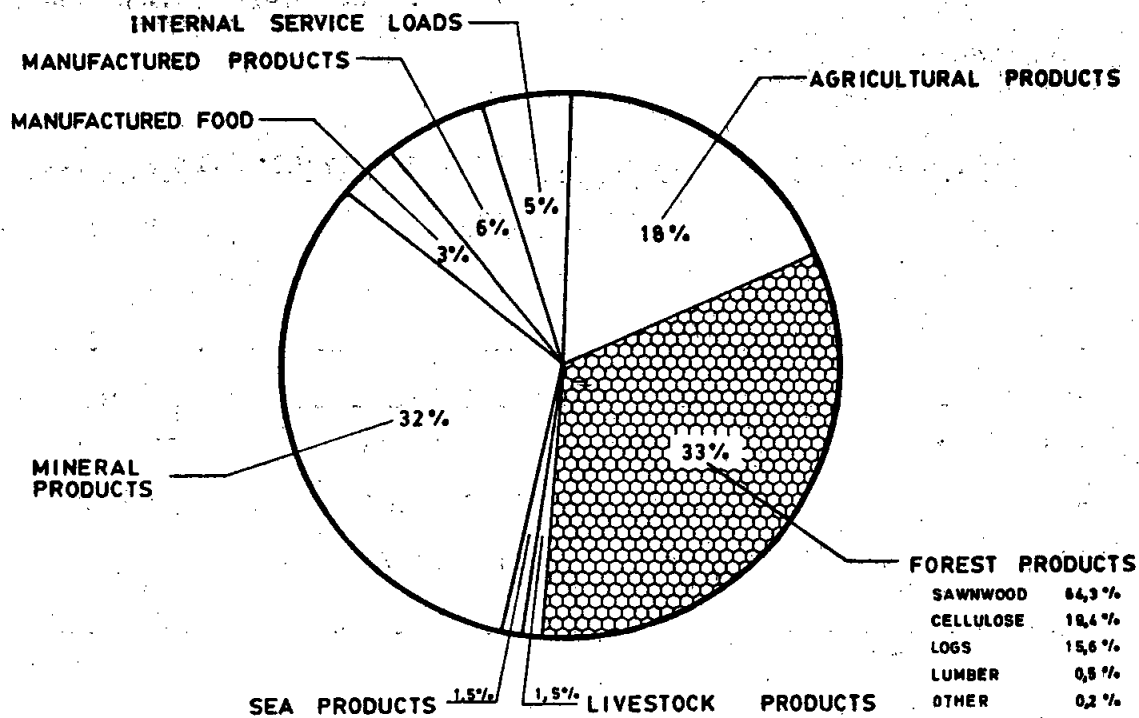
1978 - 1980

ton-km.

YEAR	TRUCK	RAIL	TOTAL
1978	474.222.163	247.851.493	722.073.656
1979	514.030.276	268.687.564	782.687.840
1980	688.295.579	261.262.372	949.557.951

During 1980 forest related products transported amounted to over 11.8 million tons, of which 77% corresponded to raw materials for sawmills, pulp & paper plants and export logs. These items combined took up 98% of the total tonnage transported.

	TONELADAS	TON.-KM.
Products	2.772.104	548.105.208
Raw Materials	9.121.679	401.452.743
T O T A L	11.893.783	949.557.951



RAILROAD TRANSPORTATION - SOUTHERN NETWORK
 PERCENTAGE OF PARTICIPATION IN TERMS OF VALUE

1980

Land transportation of forest materials has some flow patterns that deserve mentioning. The flow of materials toward the VIII Region ports represents 19% of the total transported in the country. The main items transported are logs, sawnwood, and cellulose, which, together with other products, represent 90% of the total volume of forest products exported nationwide. This transportation is originated mainly within the VIII Region itself. The flow of materials rose 11% in 1980, with respect to the preceding year, mainly due to increases in transportation of sawnwood and logs. 59% of transportation was done by truck and the remainder by rail.

Other major flows of materials are those toward the pulp producing plants in Laja and Arauco. The former takes up 13.5% of the national total, and the latter 9.2%, in both instances mainly by truck.

The flow of materials toward the Metropolitan Area is rated as moderately important, same as that toward Nacimiento and those originating in the VIII Region. The flow toward the Metropolitan Area accounts for 5% of the national volume, and is made up mainly by transportation of Radiata pine sawnwood, originated in the VII and VIII Regions (45.3% and 23.7% respectively).

The most important flows of materials were those toward the San Vicente - Talcahuano Shipping Complex, and to Lirquén, all within the VIII Region. The following table shows them in order of importance (in 1,000 tons):

FLOW OF MATERIALS	TRUCK	RAILROAD	T O T A L
To Ports in the VIII Region	1.233.3	853.3	2.086.6
To Laja	1.045.7	561.1	1.606.8
To Arauco	1.076,7	0.0	1.076.7
To Metropolitan Region	501,6	78.4	580.0
To Nacimiento	572.4	-	572.4
From VIII Region to others	*	447.7	447.7
Within VIII R.; Radiata Pine Sawnwood	*	435,5	435.5
Native Wood from IX R. to others	*	52.6	52.6

* No data.

Port Demand

The volume of forest products handled by both land and sea ports was 2.3 million tons in 1980, higher by 11.8% with respect to 1979.

The shipping complex in the VIII Region handled 30% of the aforementioned volume... The VIII Region ports are the only ones that have the necessary infrastructure for the massive handling of forest products. The loaded volume rose at a rate of 70% yearly during the last four years, indicating an ever increasing demand for port services.

The Talcahuano-San Vicente Shipping Complex handled 74.9% (1.7 million tons) of the total, with Radiata pine log shipments accounting for 52%, sawnwood shipments for 27.4% and cellulose, 14.9%.

This increase in exports volume has given rise to serious infrastructure problems in ports and roads of the VIII Region. This fact prompted the pertinent authorities to take several steps aiming at both the speeding of the shipping process and the relief of the congestion in the ports.

The lack of appropriate road and shipping facilities south of the VIII Region has frustrated projects related to the export of forest products. The high investment cost of developing the necessary infrastructure makes some industrial projects too costly for profitability.

Were these conditions a bit more favorable, it would be possible to increase foreign sales at a faster pace, especially as regards logs and sawnwood from native species.

PUERTOS DE EMBARQUE DE EXPORTACIONES

SHIPMENT PORTS OF FORESTRY

FORESTALES (1976-1980)

EXPORTS (1976-1980)

(TON)

REGION	PUERTO EMBARQUE	1976	1977	1978	1979	1980
I	Arica	158	2.774	795	1.903	3.373
II	Antofagasta	69	1.180	347	930	487
IV	Coquimbo	---	---	---	75	---
V	Valparaíso	6.485	10.226	5.410	7.014	10.326
	San Antonio	3.443	7.641	16.577	52.443	8.274
	Los Andes	40.624	48.613	28.589	35.138	46.916
	<u>SUB-TOTAL</u>	50.552	66.480	50.576	94.595	65.516
A.M.	Cerrillos	8.006	12.442	3.453	---	---
	Pudahuel	198	---	94	267	90
	<u>SUB-TOTAL</u>	8.204	12.442	3.547	267	90
VIII	Lirquén	215.077	311.573	476.842	406.540	349.796
	San Vicente	362.188	370.543	718.670	812.059	175.585
	Talcahuano	241.458	205.508	332.138	655.059	1.561.157
	<u>SUB-TOTAL</u>	818.723	887.624	1.527.650	1.874.274	2.086.538
IX	Longuimay	5.328	9.756	7.159	4.797	10.332
X	Puyehue	112.071	72.272	47.297	84.890	128.930
	Valdivia	33.446	11.410	21.137	1.752	---
	Puerto Montt	12.779	996	2.541	1.055	5.771
	Panguipulli	---	---	---	733	---
	Huahún	---	---	---	7.233	13.243
	<u>SUB-TOTAL</u>	158.296	85.026	70.975	95.663	147.944
XI	Coyhaique	175	1.567	2.674	247	1.009
	Aysén	---	---	43	477	698
	<u>SUB-TOTAL</u>	175	1.567	2.717	724	1.707
XII	Punta Arenas	3.547	1.453	366	539	2.804
	<u>T O T A L</u>	1.035.124	1.050.435	1.642.713	2.073.500	2.318.719

--- No se embarcó

--- No Shipment

FUENTE: "INFOR." (Con Estadísticas de Superintendencia de Aduanas)

SOURCE: "INFOR." using statistics the Customs Superintendency)

3. EMPLOYMENT

Employment in forest activities is the least well known variable, due to the large amount of activities involved and to the seasonal pattern which they present, added to the very vast geographical distribution of the producing units.

The FORESTRY CENSUS has thrown light on employment in the Primary Manufacturing Activities, with research still to be conducted on employment generated by Silvicultural Activities and Logging Operations, as well as transportation and services.

The Forestry Institute of Chile has undertaken a study on this matter for the VIII Region's forestry sector, itemized by activities. The partial results thereof allow for an estimate of employment in forest activities at a national level in 1980, in the most relevant activities. Figures are shown below.

The LEVEL OF EMPLOYMENT in forest activities in Chile amounts to about 50,000 persons, 20,000 engaged in silviculture and exploitation, and 30,675 engaged in Primary Manufacturing Activities.

SHARE OF EMPLOYMENT (%)

Nurseries	5,9
Thinning	4,9
Reforestation	28,7
Logging	8,1
Sawmills	35,1
Board Manuf. Ind.	4,2
Newsprint	1,8
Cellulose	4,0
Ports	3,8
Transportation	3,5

There is no updated data as to highly labor-intensive activities, such as seed and mushroom collection, firewood and charcoal extraction, and the like.

There are some 950 professionals included in the foregoing figures, who graduated from the Schools of Forestry of the Southern University, University of Chile, University of Concepción and the Catholic University of Talca. They are engaged in production, research and service activities.



The SEASONAL pattern of this activity implies permanent employment in industry and quite seasonal in the forests.

Nurseries employ an average of 3,000 persons nationwide, with the peak in December (77% of the total), decreasing in April down to 22%. Reforestation activities employ 14,530 persons, with the maximum during the period of preparation of areas to be planted (100% employment), and the minimum in April with 15%. Forest exploitation employs 4,126 persons throughout the country, with the greatest demand in November (74.8%), and the lowest in the period from March to May (49.3%).

Therefore, the greatest overall demand of labor occurs between November and February, and the minimum between March and May.

The GEOGRAPHICAL DISTRIBUTION of labor follows a nearly unitarian correlation with production, with 50% of labor in the VIII Region; 15% in the IX Region and 14% in the X Region.

MANUFACTURA FORESTAL PRIMARIA 1980 INSTITUTO FORESTAL



M A R C H I L E N O

- LEYENDA
- Carretera Panamericana
 - Camino
 - Ciudades y Poblados
 - Línea férrea
 - Límite Regional
 - Límite Provincial
 - Lagos y Lagunas
 - Aserraderos

ESCALA 1:2.000.000

DIBUJO: MONICA GONZALEZ ARENAS TECNICO FORESTAL

VII REGION

PRINCIPALES ASERRADEROS

RAZON SOCIAL	UBICACION	CAP. INSTALADA (m ³) AÑO
ASERRADEROS COPINUE LTDA.	COPINUE	96.000
CONTRAL P. BARRIOS MOLINA	CONTRAL	13.608
SAMUEL PEREIRA ESPINOZA	ENFERADO	13.608
MARCEL CAMERO MONTICINOS	ENFERADO	13.608
VICENTE CAMERO MONTICINOS	ENFERADO	13.608
MARIO TILLERIA I BLOS	ENFERADO	11.975
EDUARDO ARIAS	ENFERADO	10.887
VICENTE CAMERO MONTICINOS	ENFERADO	10.887
AGRIC. Y FORESTAL LEIS OSSANDON	CUREPTO	9.794
RAIL REICHMANN	MACURELA	8.247
MARIO ARELLANO	CONTRAL	8.165
PATRICIO BRAVO	PUTU	8.165
MADERAS SAN BASILIO	ENFERADO	8.165
OSCAR DIAZ DIAZ	CURAPIPE	7.811

INDUSTRIA DEL ASERRO

PROVINCIA	N° ASERRADEROS	PRODUCCION 1980	MANO DE OBRA
CURICO	13	7,01	108
TALCA	68	85,57	943
LINARES	7	2,07	45
CAUQUENES	15	5,57	15
TOTAL	103	227.293 m ³	1.171

CELULOSA

PRODUCTO	EMPRESA	PROVINCIA	PROD. '80 (Ton)	MANO DE OBRA
CELULOSA	CELCO S.A.	TALCA	191.525	425
TOTAL	—	—	191.525	425

VIII REGION

PRINCIPALES ASERRADEROS

RAZON SOCIAL	UBICACION	CAP. INSTALADA (m ³) AÑO
MADERAS RACINIEVO S.A.	RACINIEVO	170.000
FORESTAL CARAMPAQUE S.A.	LABAQUE	162.000
CONTRAL BIO BIO S.A.	CONCEPCION	160.000
ASERRADERO SAN PEDRO S.A.	CONCEPCION	113.000
E.F.A. ESCUADRON	CONCEPCION	103.000
FORESTPORT COMERCIAL LTDA.	CABENO	90.000
ASERRADERO CHOLGUA LTDA.	CARTERA	47.200
E.F.A. PILPILCO	PILPILCO	47.200
MADERERA LEONERA LTDA.	NEQUE	43.200
HEREX LTDA.	COLEBE	44.500
AGRICOLA Y FORESTAL DICHOCO LTDA.	NEQUE	43.200
URRIZOLA Y CIA.	MULCHEN	36.000
FORESTACION NACIONAL S.A.	MULCHEN	35.400
E.F.A. LA ARAUCANA	LOS ALAMOS	33.000
ASERRADEROS ANDIMOS	QUIRINE	31.000

INDUSTRIA DEL ASERRO

PROVINCIA	NUMERO ASERRADERO	PRODUCCION 1980	M. de O. (MAX)
RUBLE	187	22,25	2.015
CONCEPCION	93	33,42	1.809
ARAUCO	84	19,12	976
BIO BIO	135	25,32	1.801
TOTAL REGION	499	1.198.312 m ³	8.601

CELULOSA, PAPEL, TABLEROS

PRODUCTO	EMPRESAS	PROVINCIA	PRODUCCION 1980 (Ton)	M. de O. (MAX)
CELULOSA	C.M.F.C. LAJA C. ARAUCO	BIO BIO ARAUCO	347.394	830
PAPEL PERIODICO	C.M.F.C. BIO BIO IMPRESA	CONCEPCION BIO BIO	134.496	400
TAB. FIBRA Y PARTIC.	CHOLGUA - MASISA	BIO BIO CONCEPCION	71.051	162
TOTALES	—	—	552.941	1.392

IX REGION

PRINCIPALES ASERRADEROS

RAZON SOCIAL	UBICACION	CAPACIDAD INSTALADA (m ³)
JUAN SPICHER RUTICOOPER	PUREN	24742
POCIRA S.A.	CURACAUTIN	21226
INDUSTRIAS MARCELO POINCARÉ	LONCOCHE	20619
AGRICOLA Y FORESTAL FLORES DEL LAJO S.A.	VILLARRICA	16495
MADERAS BIO BIO	TEMUCO	14843
JORGE HORN Y CIA. LTDA.	LUMACO	14433
SUMERICAMBA DE MADERAS	TEMUCO	14433
POCIRA S.A.	CURACAUTIN	14433
KAMAL GAZAVE E HIJO	CURACAUTIN	13472
FORESTAL SANTA MARTA	TOLTEN	12371
INDUSTRIA MADERERA POLIDORA S.A.	COLLIPULLI	12224
GUSTAVO FARREREROS S.	LONQUIMAY	11792
SANTIAO RACHMANN E HIJO	VOLCANUE	10309
SOCIIDAD MADERERA BAS LTDA.	CAP. PASTENES	10309
AGRICOLA Y FORESTAL LAS RAICES LTDA.	TRAIGUEN	9897

INDUSTRIA DEL ASERRO

PROVINCIA	NUMERO ASERRADERO	PRODUCCION 1980	MANO DE OBRA (MAX)
MALLECO	163	56,42	2167
CAUTIN	194	43,62	1724
TOTAL REGION	357	322.782 m ³	3891

TABLEROS

PRODUCTO	EMPRESA	PROVINCIA	PRODUCCION 1980 m ³	MANO DE OBRA (MAX)
TABLEROS CONTRACHAPADOS	POCIRA S.A.	MALLECO	2950	—
TABLEROS DE PARTICULAS	POCIRA S.A.	MALLECO	3113	637
TOTALES	—	—	6063	637

X REGION

PRINCIPALES ASERRADEROS

RAZON SOCIAL	UBICACION	CAP. INSTALADA (m ³)
ASERRADEROS E IMPRESOS VALDIVIA LTDA.	VALDIVIA	23.585
FORESTAL VERDE LTDA.	LA UNION	18.866
JOSE GONZALEZ GOMEZ	LA UNION	16.509
LAVARRERA DE MADERA S.A.	VALDIVIA	14.433
ASERRADERO VISTA ALBA	VALDIVIA	14.151
COMPLEJO FORESTAL MADERERO PANQUIPULLI	NELTUNE	14.151
FORESTAL SANTA ANA LTDA.	OSORNO	14.151
MADERAS CORAL LTDA.	TRAPON	10.613
KARAH KAVAK ALVARELLI	FEDELA	9.434
HECTOR VERA MASIAS	CHONCHI	9.434
ERIQUE GUTIERREZ REYER	OSORNO	9.434
FORESTAL VERDE LTDA.	LA UNION	8.491
TORIAS PAREAS S.	OSORNO	8.247
XILOTECNIA INDUSTRIAL Y MADERERA LTDA.	LA UNION	7.075

INDUSTRIA DEL ASERRO

PROVINCIA	N° ASERRADEROS	PRODUCCION 1980	MANO DE OBRA
VALDIVIA	163	59,32	2.217
OSORNO	99	24,62	1.864
LLANQUIHUE	59	7,82	482
CHILE	84	8,02	482
PALENA	9	0,32	—
TOTAL	414	339.767 m ³	4.1125

PAPEL, TABLEROS, CHAPAS

PRODUCTO	EMPRESA	PROVINCIA	PROD. '80	MANO DE OBRA
PAPEL	C.M.F.C. VALDIV.	VALDIVIA	16.800 Ton	152
TAB. PARTICULAS	MADERA VALDIVIA	VALDIVIA	13.091 Ton	137
CHAPAS	MADERA IMPRESA	VALDIVIA	6.873.438 m ²	—
TAB. CONTRACH.	SOC. MADERA PELLARI	VALDIVIA	12.680 m ³	1085
OTROS TABLEROS	SOC. MADERA PELLARI	VALDIVIA	19.206 m ³	—
TOTALES	—	—	—	1374

