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FOREST OUTLINES OF BRAZIL¹

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INTRODUCTION

Brazil is situated between parallels $5^{\circ}16'20''$ North and $33^{\circ}44'32''$ South, and between meridians $34^{\circ}47'30''$ and $73^{\circ}59'32''$ West of Greenwich, including distance of 4390 km in the North-South direction, and 4320 km in West-East direction. The total area of the country is around 8.512 million km^2 , divided into five regions: North, Northeast, Center-West, Southeast and South. About 90% of its territory have a tropical climate, for they are located between the tropics. With the exception of a few areas in the Northeast region, soil and climate conditions are everywhere favorable to plant growth. The potential biomass

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yield has been estimated to be 30 to 50 (metric) tons / ha. year in the Amazon and coast regions, and 15 to 30 tons / ha. year in the backlands.

FOREST RESOURCES

The Brazilian part of the Amazon basin includes the greatest continuous forest area in the world, with around 5.8 million km², that is, ten times the area of the French territory, and 80% of present forest resources of Brazil. But the country includes also the "caatingas" on the North east and the "cerrados" on the Southeast and Center-West, which are kinds of savanna, as well as temperate forests, on the South region and planted forests scattered all over the Brazilian territory.

There are also 126 reserved forests, of which 39 are national, 68 state-owned, 18 municipal, and one private, with a total area of about 12.567 million hectares (125,670 km²). There are also biological and ecological reserves, of which 30 national, 96 state-owned, 18 municipal and 3 private, with 9.588 million ha. (95,880 km²). There is, therefore a reserved area of around 221,550 km², that is, approximately 2.6% of the national territory.

REFORESTATION

Reforestation in Brazil started in 1861, but, with economic aim, it was initiated in 1904, with the introduction of eucalypts by Edmundo Navarro de Andrade.

Nowadays, Brazil has a reforested area of about 1,000,000 ha, mainly with *Eucalyptus* and *Pinus*. New forests with an area of 84,800 ha were planted in 1990, 1% with *Eucalyptus*, 34% with *Pinus*, and 5% with species of other genera.

The main species of *Eucalyptus* used in Brazil are: *E. grandis*, *E. saligna*, *E. urophylla*, *E. camaldulensis*, *E. creticornis*, *E. citriodora*, *E. cloeziana* and *E. viminalis*, *E. dunii*, *E. pellita*, besides several hybrids.

The main species of *Pinus* are:

- a) Tropical: *P. caribaea*, *P. oocarpa* and *P. kesiya*.
- b) Subtropical: *P. taeda* and *P. elliottii*.

Due to soil and climate conditions, Brazil is a privileged country for forestry, specially with reference to yield per hectare. year, and length of cutting cycle. For eucalypts only 6 to 8 years are needed to reach a yield with characteristics required by the pulp and paper industries. At that age, well conducted eucalypt forests yield from 40 to 50 m³/hectare.year of wood.

For the genus *Pinus*, the cutting cycle takes from 18 to 25 years, with about 23 m³/hectare.year.

TABLE I. Productivity of *Pinus* forests.

Country	m ³ /ha.year	Percentage of yield in Brazil
Finland	5	20%
Portugal	10	40%
U.S.A.	15	60%
South Africa	18	72%
Brazil	25	100%

Data from ABECEL.

TABLE II. Average productivity of forests in Brazil.

Genus	Productivity (steres/ha.year)
<i>Eucalyptus</i>	42
<i>Pinus</i>	34
<i>Araucaria</i>	16
<i>Gmelina</i>	36
<i>Acacia</i>	35

Data from 6th Brazilian Forest Congress.

In recent years, the Brazilian Government has carried out a policy of stimulation of small farmers, thus obtaining an increase of productivity and more ecological conscience in small communities. The small farmer receives seedlings to be transplanted, inputs, and technical orientation for planting and management of his forest. Afterwards, he gets money selling wood to those who helped him.

The results of reforestation in 1990 are included in **TABLE III**.

TABLE III. Reforested areas in Brazil in 1990, in ha.

Genus	Planting	Replanting	Total
<i>Eucalyptus</i>	71,224	35,432	106,656
<i>Pinus</i>	10,199	5,707	15,906
<i>Araucaria</i>	3,330	4,370	7,700
<i>Gmelina</i>	0	0	0
<i>Acacia</i>	0	0	0
Other species	21	1,580	1,601
Total	84,774	47,151	131,925

Data from 6th Brazilian Forest Congress.

From now on a decrease in the planting of new forests is forecast, with an increase of replanting, as shown in **TABLE IV**.

The most important activities of reforestation are connected with the needs of industries of pulp and paper, charcoal, boards, pencils and energy (firewood).

The production of wood by planted forests was about 82.300 million m³ (solid), with a consumption around 263.490 million m³ (solid). The deficit is provided by 181.190 million m³ (solid) obtained from natural forests.

TABLE IV. Planting and replanting of forests proposed until 1995 (in 10^3 ha.).

Year	Planting	Replanting	Total
1991	52.6	42.3	94.9
1992	45.4	56.9	102.3
1993	50.4	63.5	113.9
1994	40.8	71.7	112.5
1995	34.2	78.5	112.7
Total	223.4	312.9	536.3

Data from ANFPC.

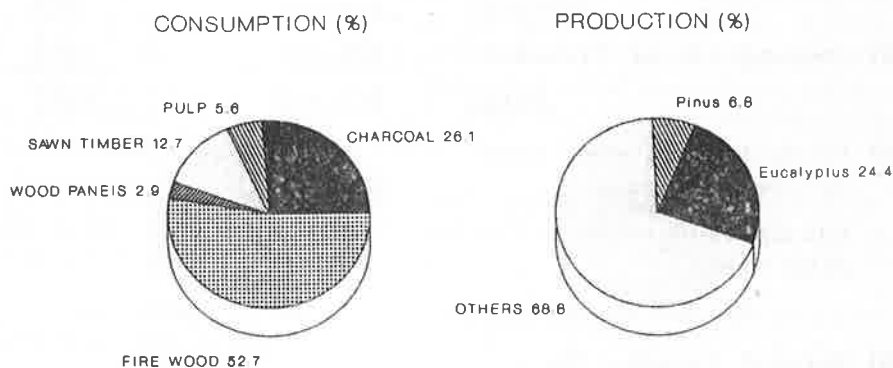
**Figure 1.** Consumption and production of wood in Brazil (1987-88).

TABLE V. Production and consumption of wood in Brazil.
(1987-88).

Consumption/Production	Equivalent in 10^6m^3 (solid)	Percentage
A) Consumption of wood in industries		
Pulp	14.740	6%
Charcoal	68.700	25%
Sawn timber	33.500	13%
Wood panels	7.500	2%
. Plywood	4.800	
. Fiberwood	1.490	
. Particleboard	1.260	
Subtotal	124.490	47%
B) Consumption of Firewood		
Total	139.000	53%
C) Production of wood from reforested areas		
Eucalypts	64.300	
Pine trees	18.000	
Subtotal	82.300	
D) Natural forests (by subtraction)		
	181.190	

Data from Technological Research Institute - Brazil.

THE INDUSTRY OF PULP AND PAPER

Among the Brazilian forest industries, those of pulp and paper are the strongest, economically, and the most advanced technologically. They have in mind the ecological problems connected with the production of wood and with the industries. A lot of money has been spent by them in reforestation programs and in the control of pollution.

In 1988 Brazil was the 8th world producer of pulp and the 11th of paper, with 4.3 million tons of pulp, and 4.6 million tons of paper.

In 1990 the Brazilian production was 3.9 million tons of pulp, and 4.7 million tons of paper. In the same year the Brazilian consumption of paper was 4.03 million tons (26.9 kg per capita). Approximately 77% of the production of paper are consumed within the country.

In 1990 the export of paper reached 957 thousand tons, besides 1,040 thousand tons of pulp, with a total value of 1,200 million dollars. In 1990 Brazil spent the amount of 304 million dollars with imported wood products: paper 194,000 tons (65% newsprint); pulp 58,000 tons (white long fiber), and paste 45,000 tons.

Nowadays the pulp and paper industries contribute with 1.8% of Gross National Product, corresponding to a value of 5.800 million dollars.

They have 135.000 employees, of which 80.000 in the factories and 55.000 on the fields.

The main kinds of paper produced in Brazil are: newsprint, pasteboard, kraft paper, paper for typing and some special types.

The main factories of pulp and paper are located in the Southeast and South regions of Brazil, specially in the States of São Paulo, Paraná and Santa Catarina, which concentrate about 85% of Brazilian paper production.

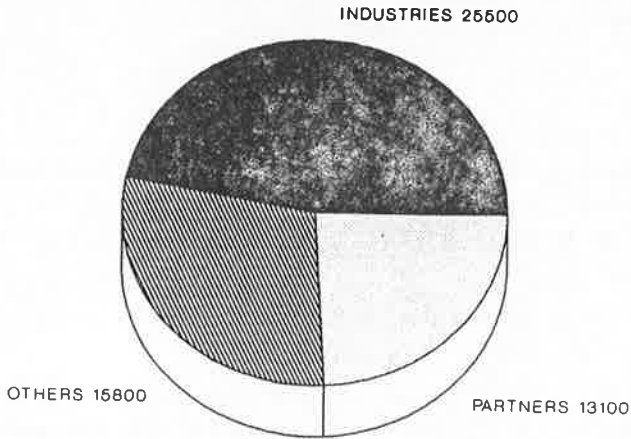


Figure 2. Employees used in planted forests owned by pulp and paper industries.

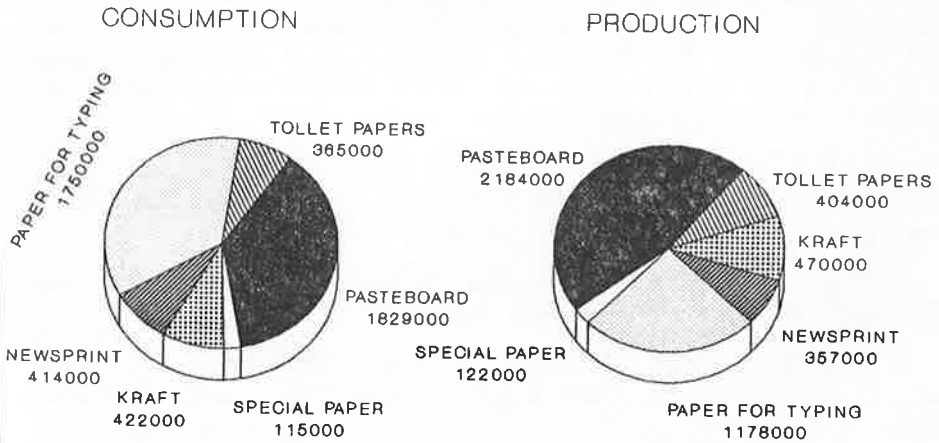


Figure 3. Consumption and production of paper, by type. (1990).

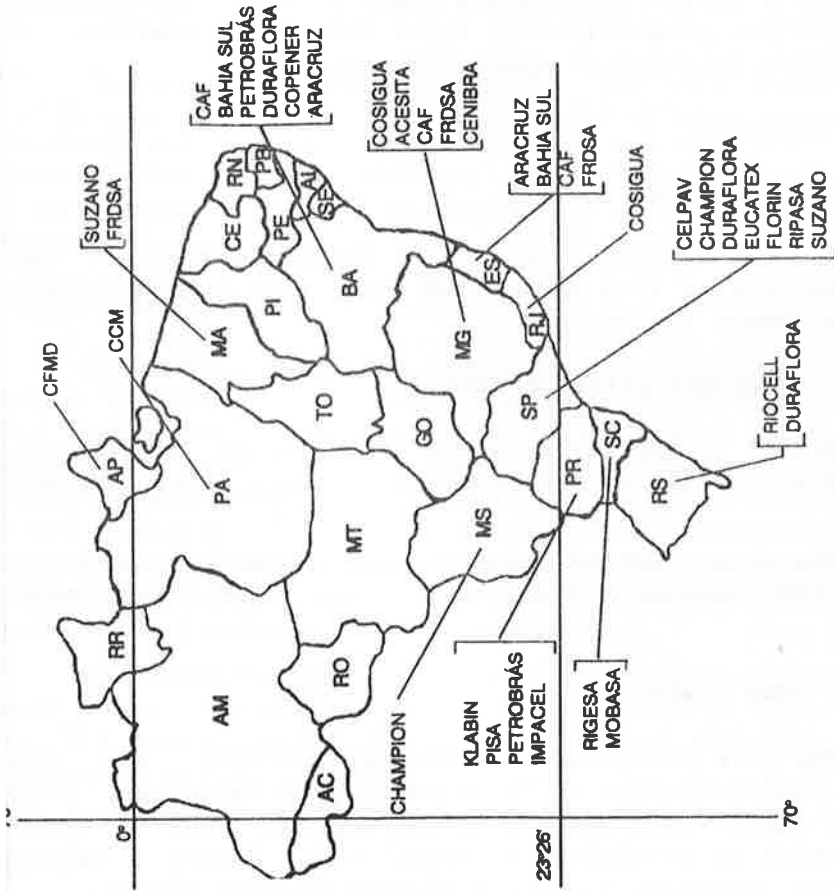


Figure 4. Geographical distribution of paper production in Brazil.

Brazilian production of short fiber pulp amounts to 67%, as compared to 33% of long fiber. On the other hand, 95% of the wood used to produce pulp come from planted forests.

The increase in world pulp consumption is estimated to reach 2.5% yearly up to the year 2000 (SBS, 1990). The National Program for Pulp and Paper forecasts the doubling of Brazilian production not later than 1996, that is, a cumulative increase of about 12% yearly.

OTHER PRODUCTS

. Wood panels

In 1990 a production of 1.35 million m³/year was reached, coming from around 300 industries, located mainly in the Amazon region.

. Fiber and particleboard

Brazil is one of the world exporters of fiberboard, with a production of 750 thousand m³/year, using eucalypt wood.

The production of particleboard is estimated to reach about 650 thousand m³/year, with *Pinus* and *Eucalyptus* wood.

. Sawn timber

The main sawn timber producers in Brazil are the South region (States of Paraná and Santa Catarina), with 60% of *Pinus* wood, and the Amazon region, with a total production of 15 million m³/year. The South region produces nowadays 2 million m³/year of sawn timber.

. Veneers

Brazil produces about 500 thousand m³/year of veneers, obtained from white tropical wood. The production of sliced veneers is carried out mainly with heavier and more decorative wood. In Southern Brazil a few species of *Pinus* are also used.

. Charcoal

Charcoal is used in Brazil for some industries (siderurgy, metallurgy, cement), and for stoves, specially in rural areas. About 78% of charcoal are made with wood from natural forests. Nowadays, about 22% of charcoal come from planted forests. This amounts to 16 million m³/year of wood.

FINAL CONSIDERATIONS

Even if holding the greatest forest resources the world, Brazil has a secondary position in wood industries. But it has ecological, social and technological conditions to improve very quickly its wood production and industrialization. Brazilian intensive forestry has nowadays a level comparable to that of the most industrialized countries, with a long silvicultural tradition. It is now mature and able to participate strongly in the economical and social development of the country.

The combination of methods of economic use of forests with principles of environment conservation is necessary, at this moment, to increase the wealth and standard of living in Brazil.

Key words: Forests in Brazil, statistics.

RESUMO

ESTATÍSTICAS FLORESTAIS DO BRASIL

Descreve-se, com numerosos dados estatísticos a presente situação florestal do Brasil, com ênfase nas flores

tas plantadas e no seu aproveitamento industrial. Salienta-se a elevada produtividade florestal no ambiente brasileiro, com abundância de luz, calor e de pluviosidade, quase por toda parte. Também se apresentam dados sobre a expansão dessa atividade nos anos próximos, até 1995.

Palavras-chave: Florestas brasileiras, estatísticas.

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