



The magic of eucalyptus in the Brazilian wonderlands

by Celso Foelkel

Brazil is a huge country with a great people. Country's population reaches 160 million inhabitants, and it is yearly increasing around 2.8 million more. This means that Brazil grows a population almost like Uruguay or Costa Rica, or New Zealand, every year. This amazing consumerist people make the country very attractive as a great market to participate in. Now, with the creation of the economic block 'Mercosul', a market of 250 million inhabitants has become available, comprising Brazil, Argentina, Chile, Uruguay and Paraguay. There is no doubt that a market with this size, in countries with rather stabilised economies, it is not to be neglected.

In the past two years, due to a finally well-succeeded economical plan, the Brazilians re-acquired the self-esteem and the 'go-ahead' morale. This represents a great push to further economical and social growth and development.

Due to former economical policies, the country developed a dynamic industry and it is almost self-sufficient in agriculture products. Only crops that require special climate conditions, such as olives, wheat, for example, demand for imports. The industry is strong in many segments: chemical and petrochemical, steel, car manufacturing, food processing, shoes, pulp and paper, etc.

The country is dependent on oil: only 60% comes from own sources. This dependence activated creativity and Brazil has most of electricity coming from hydraulic sources, and has also more than 1.5 million vehicles running by alcohol moved engines.

The pulp and paper industry is considered to be a goldmine to the economy and it has an enormous social importance due to job and strong currency generation. Brazilian pulp and paper industry reaches \$8-9 billion total sales per year, exports being \$2.5 to \$3 billion. This corresponds to about 6% of country's exports and the size of the industry is responsible for 1.8% of the GNP. The estimated number of jobs generated is 100,000, but this is surely an under-estimated figure. There are no doubts that more than 1 million people are directly or indirectly linked to the pulp and paper industry.

Due to the fact of having more than 75% of the population living in large cities, paper recycling is a growing business because the simplicity of collecting. This is becoming an important social and economical activity, even considering the low per capita consumption of the average Brazilian (34 kg/inhab/year). From the 6 million tons of manufactured paper, 35% comes from wastepaper. The informal economy, comprising hundreds of wastepaper pickers, also generates a good number of jobs - fundamental in a developing country.

Paper is a product of growing consumption in the country: yearly consumption grows at a 4.2% rate, more than double the population growth. This is mainly due to the average income growth of the Brazilians. A part of the population is being given access to many paper products they were not used to. Papers like tissue, printings and writings, newsprint and packaging are growing at an average rate of 6% over the past five years. At

these rates, total paper requirements by the year 2005 it will be 9 million tons, 50% more than today's production. As I have said before, in Brazil the numbers are enlarged by two main factors: size of the market and growth rates.

Government is aware about this and is starting incentives to forest plantations and new capacities in P & P. This growth for the industry means to supply domestic consumption and to generate surplus for market pulp and paper exports, essentials to the balance of trade health. A new growing season in the P & P industry is expected to happen soon, due to these opportunities.

Brazilian Government and the Brazilian Paper and Pulp Manufacturers' Association are eveloving strategies to deal with a new production boom to happen along the next 20 years.

An optimistic investment plan of \$13 billion to happen till 2005 is on way. Substantial growths are expected in pulp (70%) and paper (45%) production.

From the total investiments, 2 billion dollars will be placed on forestry (plantations, genetic upgrading, mechanisation, environment improvements).

Brazilian pulp and paper industry is based on plantations. Fast-growing trees provide the competitive advantage to the industry. Wood cost per admt of pulp is below 120 dollars for eucalyptus kraft. This corresponds to 25-30% of direct cost and 20-25% of total cost.

Although most of the capacity is based on eucalyptus; pines (loblolly and caribbean pines) also have a good growth and they are low cost woods. Long fibre domestic consumption could be easily supplied with no major problems. It is only a question of not placing all eggs in the same basket.

Due to the scarcity of wood for furniture and other high-value uses in south Brazil, eucalyptus and pines are being considered as source of wood not only to the P & P industry, but in an integrated way for multiple uses to the P & P, furniture, lumber, fuelwood, etc. This new philosophy opens new markets to these woods and it will reduce the pressure on the use of native hardwoods by the lumber industry.

All Brazilian pulp and paper industry depends on plantations. Only wood coming from planted forests are raw materials to manufacture pulp and paper. However, those who believe that Brazil is covered by 'green deserts' due to plantations, they should know that total eucalyptus plantations correspond to 2.9 million ha and pine plantations about 1.7 million ha. For pulp and paper manufacture, the forest area corresponds to 1.4 million ha.

4.6 million ha of planted forests are equivalent to 46000 km², or 0.54% of Brazil's total country area (8.5 million km²), 0.16% being for pulp and paper purposes.

46000 km² is about 120% of Netherland's area, just to have a reference. The plantations in Brazil are not concentrated, but spread evenly from North to South, becoming the source of wood for many different purposes (lumber, hardwood, veneer, plywood, particleboard, furniture, pulp and paper, etc).

Just for fun: let's suppose that the world production of primary chemical pulp (about 130 million tons) could be made in Brazil using high quality fast-growing eucalyptus plantations. The total required area of forests would

be 17 million ha, or 2.0% of the country's area. It is still far below the world average area of pastures (25% of the available lands according to the 1992 World Environment Report of the World Bank).

Brazil in figures

<i>Population:</i>	160 million
<i>World ranking:</i>	11 ^o
<i>GNP / capita:</i>	\$3000/inhabitant
<i>Total exports:</i>	\$50 billion
<i>Total imports:</i>	\$50 billion
<i>World total paper and board capacity:</i>	310 million tons
<i>Brazilian paper production:</i>	5.8 million tons
<i>Brazilian pulp production:</i>	5.8 million tons
<i>Market pulp:</i>	World capacity: 38 million tons
	Eucalyptus (total): 5.4 million tons
	Brazilian eucalyptus: 2.4 million (46%)
<i>Brazilian market pulp exports:</i>	2 million tons
<i>Brazilian paper exports:</i>	1.2 million tons
<i>Brazilian paper imports:</i>	0.8 million tons
<i>Eucalyptus plantations growth rates:</i>	8 - 10 admt/ha/year
<i>Pine plantations growth rates:</i>	3 - 5 admt/ha/year

Sustainable Forestry to Pulp & Paper Production

Eucalyptus is a magic tree. It also provides a magic fiber to the pulp and paper industry.

This masterpiece of nature was born in Australia, but moved to Brazil to grow together with the country and to develop social welfare. It is essential to do justice to this tree. It deserves our appreciation, our recognition and our most sincere thanks.

What we shall understand is that wood is a man's necessity and forests are man's and nature's requirements. It is good to know that we need production forests and preserved forests. This understanding is not to be restricted to the forest area, but enlarged to the agricultural, social and forest network. We shall avoid extremism 'in favor of environment', many times with clear damages to man and to nature. We shall not place in opposition things that are fully compatible, as preserved forests and production forests or plantations and natural forests.

It is fundamental to plant trees in the planet. We cannot fight against this need. It is also a way to avoid that the remaining natural forests be harvested for human consumption. How and where to do it? Once more, it is something to be faced case by case. There is no generic rule, but planting of new forests could be destined to already degraded areas, that had forests in the past. It is also important to evaluate the social benefits to the local population, not only the benefits to the fauna and flora.

Production forests demand sustainable environment for their growth and recognition by people. Part of the definition of sustainability is to provide goods to society. Thus, it is fundamental to use the forests. Each one will require the own model. We have highly productive forests (plantations), natural forests managed for production, preserved forests to guarantee biodiversity and protection forests (for environmental reasons, as example, to regulate water flow in a watershed).

Sustainability implies in a three leg concept: economi-

cal, environmental and social. Each situation may require the legs with somewhat different sizes and weights.

Forestry issues for reflection

With the purpose of bringing people to reflect about forestry, some of the most questionable issues on this activity are being presented. It is important to face these questions in a constructive way, even so, because the most enthusiastic questioners wish to continue to use forest products in their ordinary like. Thus, a common ground has to be achieved.

Issue 1: Loss of biodiversity

This is not applicable when new forests are established in degraded areas, old and eroded pastures, etc.

Issue 2: Plantations / monocultures

There are restrictions to homogeneous plantations when they are huge and with no care about blending plantations with other forests and agricultural activities. We shall consider the whole network to identify its environmental health. Ecological and well-balanced landscaping is the most sustainable way to grow plantations.

Issue 3: Concentration due to economy of scale

Again, the network is fundamental. It is also possible to compensate by the multiple use of the forest and of the tree, blending forestry and agroforestry systems to enrich them.

Issue 4: Exotics

It is difficult to speak about geographical frontiers nowadays. Since exotics are well studied and adapted to the places they are growing, like eucalyptus in Brazil, why to be afraid of them?

Eucalyptus and pines are becoming global species: they are no longer exotics, you will find them everywhere, growing as trees or incorporated in products.

Issue 5: Cloning

Cloning is a technique that enables the user to have homogeneous raw material. As a consequence, quality is better and costs lower. It is one technological alternative that gives the final user a better product at a lower cost. The fundamental environmental issue is that the forester must be aware of the risk of concentrating a single genome in an area. Good planning is required to avoid potential damage, such as detrimental effects to soil fertility and potential attacks by pests or diseases.

The best alternative is to blend cloned forests with other agriculture uses. Thus, agroforestry and multiple use of the forest products are interesting options to those involved with cloned forestry. A well-planned mosaic of clones, natural forests and agricultural uses is the most adequate solution.

Issue 6: Clear cuts

It is a controversial issue, but in the way to be clarified through good science. Through a good harvesting planning, the problems of clear cutting may be minimised. Also, multiple uses cooperate to remove wood gradually from the forest.

Issue 7: Preservation of natural forests

This is an everybody's commitment and a legal obligation. Harvesting of natural forest must require special

permits.

Issue 8: Minimum environmental impact practices

The forester must evaluate the environmental impact of his activities and look for minimum effect techniques.

Issue 9: Use of agrochemicals

Toxic compounds are still required in the combat of pests, diseases, insects. However, through research and creativeness, this practice may be minimised.

Issue 10: Social impacts

Although some improvements in this subject, there is still a lot to be done. It is important to consider the impact of mechanisation on the local job generation. This measure, when required, should be well planned.

Issue 11: Social forestry

Social forestry is associated with the production of wood by small farm owners, in small scale, as part of their agricultural products. Few years ago, social forestry was poorly valued by the large scale wood producers. However, it is being now considered as one the best alternatives for next century.

Issue 12: Agroforestry

Farmers and forest-based companies have already discovered the agroforestry potential. Thus, agroforestry is a natural trend.

Issue 13: Multiple uses of forests

There is a growing interest in having more than a single product coming from the forest. Essential oils, fuelwood, bark, wood chips, honey, fruits, and many more: this is the new menu from the forests.

Issue 14: Forest certification

A trend to give reliability to the forest industry: EMAS, ISO 14000, FSC, CERFLOR, BS 7750 and so one, they are key points now.

Issue 15: Forest legislation

Legal restrictions are necessary but cannot be stricter than required. Forest-based industry must follow the process in a continuous dialogue and good willingness.

Issue 16: Forest research and the role of universities

It is already time for the academic world to perform the role of extension and to be more linked to the public, helping community to better understand technical, environmental and social issues of forestry. Research must provide knowledge to decision-making processes. The next R&D generation will not be regarded only with the technological issues of forestry. Instead of focusing on specific subjects, the research will be more holistic, more interdisciplinary, more cooperative, and covering broader matters. Research will be directed to problem-solving, aiming results and helping to understand questions marks. R&D is no longer a process just destined to add knowledge without demands. Our prediction is that the preference for researching will be fields as natural resources conservation, environmental education, sustainable management, agroforestry, social and community forestry, environmental impacts and minimisation, etc.

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Celso majored in Forestry at the Luiz de Queiroz College of Agriculture, University of São Paulo, Brazil. He has an MSc in Pulp and Paper Technology from New York State's College of Environmental Science and Forestry, Syracuse.

After working for four years with Cenibra, he joined Riocell in 1979 as manager of the Technological Centre. In 1990 he was appointed director of technology and environment. The Centre was converted to a profit/business unit under his guidance in 1993, with the main objectives of generating, developing and marketing technology in the forestry, industrial and environmental segments.

He has a wide involvement with many associations.

He is currently involved with the Technical Association of the Pulp and Paper Industry, the Brazilian Technical Association of the Pulp and Paper Industry, the Society of Forestry Research, the Brazilian Pulp and Paper Manufacturers' Association, the Brazilian Pulp Exporters' Association, the Brazilian Association of R&D in Industrial Companies, and the Brazilian Industrial National Confederation.

He has been a professor at both the University of São Paulo and the Federal University of Viçosa. He defines himself as a continuous generator and improver of technologies, and a never-ceasing educator of people. He is driven by the desire to learn and to teach, placing great emphasis on results.



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