

# SRC WITH EUCALYPTS IN BRAZIL

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## 1. ABSTRACT

*Eucalyptus* were introduced in Brazil in the earlier 1900's by Edmundo Navarro de Andrade with the objective of producing sleepers and firewood for the São Paulo State railroad Companhia Paulista de Estradas de Ferro in substitution to the use of native timber.

In the 40's large plantations of eucalypts were established in Minas Gerais, in the Rio Doce Valley to be used as raw material to produce charcoal used as a substitute for coke to reduce the iron ore in the pig iron and steel industry of that State. From the first day of its introduction in São Paulo by Edmundo Navarro de Andrade until 1966 400,000 hectares of eucalypt plantations were established in Brazil for industrial purposes.

To supply the increasing demand for timber as raw material for different sectors of the economy the Brazilian government launched in September 2<sup>nd</sup> 1966 Law 5106 providing fiscal incentives for afforestation and reforestation. According to this law people and companies could apply up to 50% of their revenue taxations in afforestation or reforestation projects.

In the 70's the Brazilian government created new incentive programs for reforestation such as Fiset – Fundo de Investimentos Setoriais-Florestamento as well as the National Program for Pulp and Paper and the National Plan for the Charcoal based Pig Iron and Steel industry. All these programs contributed to the increase of the short rotation plantation forests in Brazil, mainly with species of the genus *Eucalyptus* and *Pinus*. In 1989 when the fiscal incentives for reforestation were extinguished by the Brazilian government the country had about 6 million hectares of eucalypt and pine short rotation plantations.

In face of the actual demand for a permanent supply of timber for various sectors of the Brazilian economy the eucalypt has been chosen as the first option due to the large number of species; considerable adaptability to different soil and climatic conditions of several regions in Brazil; availability of improved seeds and genetic material for vegetative propagation; existence of hybrids and clones adapted to Brazilian conditions for different uses of the timber; known silvicultural treatments and techniques to establish large plantations with species of this genus in Brazil.

Actually the eucalypt timber is used for pulp and paper production; for charcoal production; for solid wood products; for medium density fibre boards (MDF); for fibre and particle boards; for oriented stranded board (OSB); for plywood and veneer; for poles construction; for firewood and biomass for energy. On the other hand it is possible to produce essential oils from the leaves of some species and tannin from their bark. Some species of eucalypt are also used in land reclamation; wind breaks; stabilization and control of dunes and reforestation of watersheds reduce runoff and increase water production.

The soil and climatic conditions of the Brazilian territory have led to the development of very well advanced eucalypt based forestry and agroforestry activities. The productivity of the short rotation eucalypt plantations in Brazil can reach 45 to 80 m<sup>3</sup>/ha/year while in other regions of the world it is around 25 m<sup>3</sup>/ha/year. This has stimulated most of the forest companies to establish eucalypt plantations diminishing the pressure on native forests. It is interesting to note that not only the technical aspects including productivity of the eucalypts were intensively studied in Brazil but also all the economic, environmental and social aspects of such plantations.

Recent studies have shown that the short rotation eucalypt plantations in Brazil do not adversely interfere in the hydrologic cycle or water production in the region where they are located. The demand for water of the eucalypt plantations are similar to that of other forest and agricultural crops in Brazil. The same condition applies to nutrients uptake. However, the efficiency of the eucalypts to use water and nutrients and solar radiation the biomass production of their plantations is greater. On the other hand, being a forest, eucalypt plantations promote nutrient cycling, protect the soil against erosion and provide shelter for wildlife contributing for an increase in biodiversity.

In Brazil forest activities correspond to 4.5% of the NGP (US\$28 billion) generating 2 million direct and indirect jobs. More than 100 thousand small farmers plant eucalypt in their properties using the family members, power and labour. Contributing to the fixation of those families in the rural areas of the country and increasing their income and improving their way of life.

With Kyoto's protocol and the advent of the Clean Mechanism Development activities there is in Brazil an opportunity for additional income by using eucalypt forest plantations to sequester CO<sub>2</sub>. Some companies such as PLANTAR and V & M Florestal already have these kind of projects under way for carbon credits commercialization.

Short rotation eucalypt plantations in Brazil are established taken into account their sustainability and therefore sound and very well studied nutrient cycling and fertilizer utilization are always considered and permanently improved by the research institutions, universities and affiliated forest companies. In the 80's eucalypt based agroforestry systems began to get more attention from researchers and today they have been used not only by small farmers but also by large companies in their own plantations and also in tree farm extension programs. This land use system allows a better occupation of the site and a more desirable situation in terms of jobs generation in the rural area of the country. Perhaps the best example of the practice of eucalypt based agroforestry in Brazil (and in the world) is the case of the CMM – Cia Mineira de Metais located in Minas Gerais state, Brazil. In year 0 eucalypt is planted in a 10 m x 3 m spacing with intercropped rice. In year 1 and 2 soybean is intercropped between the rows of eucalypt

and finally, from year 3 to 11 pastures and cattle compose this final silvopastoral system.

The sustainable use of these short rotation eucalypt plantations in Brazil which produces goods and services and generate jobs and income for the country's population is the best way to keep them permanently contributing to the development of Brazil and the protection of its forest capital.