# Greenhouse gases dynamics in Brazilian forests

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Background

Brazil can be considered a forest country with approximately 524 million hectares (61.5% of its territory) of forests (natural + planted). Of the 7 million hectares occupied by planted forests, 4.5 million hectares correspond to eucalyptus and 1.8 million hectares correspond to pine. Eucalyptus plantations are expanding to most Brazilian states, with planted area presenting a growth rate of 7.1% per year between 2004-2009.

Forest plantations have direct impact on Low Carbon Agriculture national policy by reducing greenhouse gases emissions (GHG). Among the voluntary measures taken by the Brazilian government to reduce GHG emissions, the program proposes: "To promote reforestation in the country, expanding the reforested area on approximately 3 million hectares, contributing to the reduction of 8 to 10 million tons C02 equivalent". Given the constant demands and investments in the forestry sector, it is necessary to make a research effort to improve knowledge and carbon balance estimates in native vegetation, as well as in planted forests and alternative production systems, which are the basis for mitigation practices evaluation. Forestry component is the focus of this project and also permeates other development proposals and ongoing projects within Embrapa projects related to this issue.

Methods

Three species were selected to compose the project study units. Eucalyptus spp, Acacia mearnsii and Pinus taeda were chosen based on economic importance and plantation extension. Selected species will be evaluated in two bioclimatic zones, two productivity levels at different development stages. Study sites were selected based on the spatial distribution and the potential future expansion of forest plantations in Brazil. Natural forests with distinct anthropogenic alteration will also be sampled from each area. Soil carbon, N20, C02 and CH4 emission will be measured during two years at all sites along with biomass. Data will be used for modeling and economics studies.

The project consists of a management plan project and eight component projects that are complementary. **It** aims to estimate GHG, carbon stocks and dynamics in representative forests in order to support public policies and mitigation alternatives. The research project will include assessments of natural and planted forests at Atlantic Forest, Savannah, Savannah/Amazon Transition Zone,Amazon, Pantanal and Pampa.