

## Conservation of the Cerrado from the valorization of socio-biodiversity products: the importance of production chains and local marketing channels

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The Cerrado occupies an area of about 20 million km<sup>2</sup> (approximately 20% of the Brazilian territory), being the second largest national biome and the richest savanna in biodiversity of the planet. Although it covers three regions of the country (Northeast, Midwest and Southeast) and housing a significant number of traditional communities and family farmers, is the biome with the lowest percentage of protected areas and therefore one of the most threatened. Strategies for the promotion of non-timber forest products (NTFP) for the conservation of the biome and promotion of sustainable development, with job creation and poverty reduction have been implemented. There are several cases in different states, of products with local supply and demand, but, in the meantime, there are fewer cases of large-scale impacts, reaching in more distant markets. Based on field research carried out in the last five years, we present a comparison of cases of promotion of NTFP chains in different regions of the Cerrado, where we highlight experiences and products of greater demand and occurrence, with the cases of Baru (*Dipteryx alata*), pequi (*Caryocar brasiliense*) and babassu (*Attalea speciosa*), which, based on different strategies of market insertion of agro-extractive organizations, promoted important changes in terms of income generation with local communities and conservation of the biome. Other products, such as buriti (*Mauritia flexuosa*), macaúba (*Acrocomia aculeata*) and other species of lesser occurrence, although less demanded, contribute to the maintenance of the diversity of forest species and the generation of complementary income to the communities.

## Contribution of non wood forest products to household income and livelihood improvement in Tunisia: the case of Aleppo pine

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Recently, there is a growing interest in the contribution of Non-Wood Forest Products (NWFPs) to livelihoods and food security among the local population. This has gained special attention given the relevance of forest heritage to alleviate poverty and improve household economies. This study focuses on determining the contribution of Aleppo pine production in Siliana province to household livelihood and food security. Data were obtained using structured surveys administered to 250 randomly selected rural household heads during the collection season. The relevance of this region as a leading Tunisian Aleppo pine producer makes the analysis especially interesting. A logistic regression, as well as food security indicators, have been performed to evaluate the contribution of NWFPs to improving household living conditions. Results support evidence that there is a significant difference between the alternative sources of revenues. The utilization of Aleppo pine was significantly influenced by age, gender, household size, distance to market, the importance of off-farm revenue. Finally, Aleppo pine plays an important role in supporting livelihoods and provides an important safety net for local population throughout the year.

## C8d: INTENSIFICATION WITHIN LIMITS: INCREASING PRODUCTIVITY WITHOUT COMPROMISING ECOSYSTEM SERVICES

### Linking soils, physiology and silviculture to optimize productivity and sustainability of planted forests

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Precision forestry uses detailed knowledge of soils and physiology to prescribe silvicultural treatments that are applied at the right time in the right location to optimize growth, productivity, and sustainability of the forest. This involves matching species and genotype to each site with an integrated silviculture regime with inputs throughout the rotation to produce the desired products and environmental services from the forest. Because of the variation that exists in soils and site quality, growth responses to silvicultural treatments often vary within a stand and across the landscape. Silvicultural treatments must therefore be implemented at these same spatial scales to address the specific limiting factors. Environmental considerations, local, regional and global markets for timber, non-timber products, and environmental services provided by forests interact with soil quality and the response to silvicultural treatments to determine the limits on intensive management. This will create a mosaic of different management regimes across the landscape that range from intensive plantation management to extensively managed natural stands to forests managed for non-timber objectives and environmental considerations. This presentation will describe how Rayonier, a timber REIT that owns 2.6 million acres, has developed Market Driven Precision Forestry to optimize the productivity, profitability and sustainability of its forest estate in the United States and New Zealand.

### Site and stand productivity impacts of slash harvest for energy: experiences from the Nordic countries

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After the oil crises in the 1970s forest biomass was considered a potential energy source and a way to decrease the oil dependence in the Nordic countries. Apart from residues from the forest industry this also included primary residues such as branches and tops available following harvest of round wood. One concern was that the moderate increase in biomass harvest, when also branches and tops were harvested, was gained at the expense of a significant increase in the nutrient export from the site. Knowing that growth in the Nordic forests primarily is limited by nutrient availability a negative impact of this additional nutrient export on site productivity and hence the production of the subsequent stand was anticipated. Therefore, a number of field experiments were established from the late 1970s and onwards with the aim to study long-term effects of whole-tree harvest on future site and stand productivity. Here we use a meta-analysis approach on published and unpublished data retrieved from 17 experimental sites planted with Norway spruce and 14 planted with Scots pine, distributed over a wide range of site types in Finland and Sweden. Results include effects on seedling survival, site productivity and stand productivity. Based on the experimental design and silvicultural measures applied over time in these long-term experiments the relevance and the practical implications of the results for whole-tree harvest operations are discussed.


The Embrapa logo consists of the word "Embrapa" in a white, sans-serif font, positioned to the right of a white stylized leaf icon. The background of the cover features a large, circular photograph of a tall, mature pine tree with a thick trunk and dense, green, needle-covered branches, set against a backdrop of a vast forest. The image is framed by a large, curved graphic element in shades of green and teal that sweeps across the right and bottom of the cover.

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