



# DEVELOPING A VALUE CHAIN FOR SUSTAINABLE PALM OIL IN BRAZIL

INNOVATIVE OIL AND CARBON SOLUTIONS

## Synopsis

### Primary investors:

- Innovative Oil and Carbon Solutions
- Inter-American Development Bank
- Climate Investment Funds

**Value chain or sector:** Macaúba

**Country:** Brazil

**Type of risk addressed:** Business model risks associated with developing a new value chain

### Type of blended finance instruments:

Equity: 3 Million USD

Contingent recovery grant: 1 Million USD

## Executive summary

This project seeks to develop the world's first commercial value chain for the production of macaúba palm oil. A German-Brazilian company called INOCAS (for Innovative Oil and Carbon Solutions) is implementing a model by which smallholder farmers harvest macaúba trees on their pastureland and receive both payments for the fruit they harvest and feedstock for their cattle. The goal is to create new jobs along the value chain; increase and diversify sales and sources of income for farmers and harvest workers; and provide environmental benefits, in the form of CO<sub>2</sub> sequestration and rehabilitation of marginal lands. More broadly, the project is seeking to prove the market, since macaúba production—which has the potential to be massively scaled up—represents a sustainable alternative to traditional monoculture palm plantations.

Blended finance is playing a critical role in this early-stage project, which involves not only a start-up company but a brand-new industry. Prior efforts to promote macaúba production in Brazil have failed; smallholder farmers were unable to make the investments needed for planting and harvesting, plus they had nowhere to easily sell what they produced. IDB Lab provided INOCAS with a contingent recovery grant of \$1 million—which has to be repaid only if the project succeeds—to help get this venture off the ground. An additional \$3 million equity investment from the Forest Investment Program, or FIP (part of the Climate Investment Funds), will finance capital costs for the farmers and for INOCAS.

### Contributed by

Marco Curatella, Dieter Wittkowski and Yuri Soares Dillon, IDB Lab. IDB Lab is the innovation laboratory of the Inter-American Development Bank (IDB).

# Introduction

In Brazil, a growing demand for palm oil has resulted in rising import costs and large tracts of forest being cleared for monoculture palm plantations, whose expansion often leads to land degradation and deforestation. The macaúba palm tree (*Acrocomia aculeata*), a species indigenous to Brazil, offers a sustainable option to the African species traditionally cultivated for palm oil (*Elaeis guineensis*), as the macaúba variety grows outside of rainforest zones and can be planted in agroforestry systems or even existing cattle pastures. It has the potential to produce enough palm oil to sustainably meet rising domestic and global demand without requiring land use change and without reducing the yield of pastures for cattle grazing. The macaúba fruit can be processed into plant oil, animal feed and a dense biomass granulate that has industrial applications.

Even though macaúba naturally flourishes in Brazil—especially in the tropical savanna region known as the Cerrado, where this project is being implemented—it remains largely untapped, as it has lacked a structured commercial value chain. Yet one third of the area of the project region of Alto Paranaíba, in Minas Gerais, would be sufficient to substitute all of Brazil's palm oil imports. In fact, in the long term, macaúba production in Brazil could exceed current global palm oil production volume by far. If this market is proven, it could be scaled up nationally and internationally, potentially disrupting the palm oil market around the world.

The four-year project, which began in 2018, is boosting economic opportunities in an area with high seasonal unemployment and low incomes for smallholder farmers and agricultural laborers. The idea is that it will smooth out labor demand by employing agricultural workers during the down season for other local crops. It will also add jobs in associated service sectors, such as logistics, as the macaúba value chain develops. When higher-value macaúba products and derivatives are introduced, smallholders will be able to complement their existing economic activity with additional income. These income effects are expected to increase in the future, as more macaúba trees are integrated with pasture or lower-value crops. In the early stages of the project, INOCAS set up a small processing facility with crushing machines, to start experimenting with macaúba products and producing samples; in 2020, the company planned to graduate to a larger interim facility, and it eventually hopes to build a state-of-the-art factory.

The project is also expected to sequester 300,000 metric tons of CO<sub>2</sub> while avoiding emissions from deforestation and reducing pressure on a region with high deforestation rates and large amounts of degraded land. This will contribute to Brazil's targets of reducing land use change and agriculture emissions.

This case study focuses on the blended finance arrangements that are opening up the macaúba market in Brazil—and hopefully worldwide in the future—while promoting financial inclusion for underserved smallholder farmers. It looks at how the financing structure has been able to:

- crowd in funding from additional investors;
- provide associated smallholders with an alternative source of income; and
- show the potential for generating real positive environmental impacts.

## Blended Finance Approach

IDB Lab provided seed capital for this venture, in the form of a contingent recovery grant of \$1 million, which the investee, INOCAS, will have to reimburse only if the project becomes profitable. This type of grant was necessary to mitigate the relatively high level of risk; after all, the project involves both new technologies (as the company seeks to develop new macaúba products) and a new business model (which includes integrating smallholders into a new value chain). The grant not only serves to de-risk the project but also to limit the company's need for borrowed capital. This approach is warranted given the environmental benefits that the development of a sustainable macaúba industry can have in the Brazilian Cerrado.

The IDB Lab grant was earmarked to develop the business model, structure the smallholder involvement and provide training to farmers and agricultural laborers. In addition to the grant, IDB Lab is administering an equity investment of \$3 million from the Forest Investment Program to finance capital costs of the farmers participating in the project and the investee. Althelia Ecosphere was hired to supervise this equity investment and provide technical and management support to INOCAS.

In leveraging the FIP resources, the project seeks to develop the first sustainable macaúba oil value chain in the world. It is based on a model in which smallholder farmers harvest macaúba fruit from the trees on their land (whether wild or cultivated) and receive payments for their labor and for the macaúba fruit that they harvest. The oil produced from the macaúba pulp and seeds will be sold to the growing palm oil market in Brazil, and the other macaúba derivatives and byproducts will be sold to various other national industries. Since this agribusiness model is based on smallholders, it has a greater development impact than extensive monoculture crops such as sugar cane, soybeans or other palm oils.

# Impact

Although the impacts of this project are still in the early stages, as of mid-2020, this blended finance investment is proving that it can attract investment and benefit local farmers and the environment. So far, it has been able to:

## Crowd in funding from additional investors

The project has attracted some financing beyond the parties involved in the IDB Lab deal, with additional funds in the form of bridge loans amounting to just over \$300,000. More investors have also stepped forward. Althelia has committed to invest additional capital (initial estimate of \$6 million) to expand the area planted—from the projected 2,000 hectares envisioned under the project to between 5,000 and 10,000 hectares—and help finance the construction of a modern oil processing facility. (Althelia's support for an interim facility was based on the purchase of carbon credits generated by the macaúba business.) Discussions are underway with Brazilian and European institutions to invest \$50-\$60 million to plant another 30,000 hectares of macaúba in the next five years. Other investors have expressed interest in participating at a later stage, once the business model is proven. On a smaller scale, two NGOs have offered concessional grants to set up a demonstration farm to showcase the role of the macaúba palm in agroforestry systems and the benefits of sustainable practices and organic certification.

## Provide associated smallholders with an alternative source of income

The INOCAS business structure and smallholder partnership model enable smallholders to derive additional income without putting up any cash. The project uses a rural partnership contract, common in Brazil, which allows landowners and third-party investors to share in agricultural ventures. INOCAS offered several options under this contract, but almost all producers elected the one in which the producers are responsible for harvesting and loading the crop and INOCAS and producers share the yields 50/50. INOCAS does the initial land preparation and planting; provides the seedlings and inputs, such as fertilizer, until the first harvesting (generally after four to five years); and provides technical assistance over the entire term of the farmers' involvement. Smallholders agree to monitor the trees and follow instructions on production and harvest provided by INOCAS.<sup>1</sup> Biological assets belong to INOCAS for 20 years, after which they are transferred for free to the associated landowners. (The macaúba palm tree is highly productive for over 30 years and has a life expectancy of 90 years.) Macaúba trees can be planted in different ways: integrated with pastureland, in thick groves or as part of an agroforestry system that includes other crops.

Identifying suitable diversified crops to cultivate also minimizes vulnerability to weather conditions. Project estimates show that smallholders are expected to generate approximately 180 reais more per day, double the average daily income for a rural worker in that area. In addition, the INOCAS operation indirectly provides extra income to smallholders, as they can qualify for subsidies due to temporary government-set price floors for macaúba.

The project also provides employment for rural workers and smallholders during periods of low agricultural labor demand. The macaúba harvest occurs from October to December, the down time for the region's main agricultural activity of coffee. By reducing job seasonality, the macaúba harvest reduces the risk of rural exodus during these periods. It should be noted that in its first years, the macaúba project complements existing sources of income, as opposed to replacing them. But as the supply chain develops, macaúba has the potential to become a primary cash crop.

By integrating the value chain through an anchor company such as INOCAS, the project also expects to develop a lean value chain, with few intermediaries, and thus increase the share of value added that accrues to smallholders. Normally, the harvesting of a crop like macaúba would risk exposing smallholder farmers to the potential exploitation of middlemen further up the chain. The sharing agreement between producers and INOCAS ensures that both parties have incentives to maximize the value of production at the beginning of the value chain.

The IDB Lab deal structure triggered the interest of smallholders already reluctant and frustrated by unsuccessful earlier attempts, by both public agencies and private companies, to cultivate macaúba. Prior to INOCAS, previous attempts at public technical assistance from a rural extension agency were of limited use. This was because smallholders were not able to undertake investments in the property needed to plant and harvest macaúba, and those who succeeded in doing so found themselves unable to sell their seeds, as there was no off-taker at the time.

## Show the potential for generating real positive environmental impacts

The resources deployed by IDB Lab will also enable smallholder farmers to comply with regulations under the Brazilian forest code. Macaúba is an integral part of the natural local ecosystem, and there is a legal requirement to ensure that farms dedicate 35% of their holdings to the reestablishment of native species and protected areas. It has been difficult for smallholders to comply with this in the past, due to a lack of bank loans and commercial facilities. Another factor is that smallholder farmers typically have prioritized individual consumption or conventional agricultural production over compliance with environmental requirements, due to their income constraints.

Having macaúba plantations located in pastureland helps to recover soil and establish a symbiotic relationship with cattle. The cattle can eat fallen macaúba fruit, and the cow manure stimulates growth of better and more abundant grass. The cows themselves benefit from the shade the palm trees provide. Macaúba groves are also said to attract wild animals and birds usually kept at bay by poor pasture and conventional agricultural practices.

Employing macaúba for commercial purpose helps to demonstrate the need to preserve this native species to smallholders. Additionally, it may reduce some of the deforestation being driven by the need to expand pastureland that is degraded or insufficient to ensure adequate income for smallholder families. Typically, these families have made short-term decisions based on securing food and income for the year and have not viewed environmental preservation as a source of sustainable income.

Seed biomass residuals produced after oil extraction can be used as both feed for animals and soil fertilizers. This is a protein-rich and low-cost product, which brings further benefits to the environment while simultaneously reducing waste. Lastly, carbon sequestration and therefore carbon credits are enhanced in areas where more macaúba trees are planted or are part of a silvopastoral or agroforestry system.

## Lessons learned

The IDB Lab blended finance structure with INOCAS represents a way of developing a new supply chain and industry on existing agricultural land. This project is gradually building confidence in the new business, while maximizing the resources that accrue to smallholder families. It has also created an anchor company capable of streamlining market development. Without this structure, the INOCAS project would not have been able to get off the ground. Though still incipient, INOCAS is expected to generate a snowball effect by attracting increased numbers of smallholder producers and interested investors. Together, the two groups are expected to provide financial resources to this emerging industry.

The financial structure that IDB Lab established undoubtedly helped to overcome the lack of public financing structures in place and the previously unsuccessful experiences with public initiatives or programs. If the project ultimately succeeds, it will generate sustainable development in depressed rural areas.

IDB Lab's presence has been important to sustain and give credibility to the blended finance structure, due to the institution's reputation as a reliable, highly qualified organization capable of building confidence in new businesses or novel financial structures. Both professional investors and INOCAS' strategic partners have singled out IDB Lab's presence as important in their decision to invest. The willingness of IDB Lab to take on early-stage risk appears to have played a fundamental role in this venture.

The blended finance structure has helped to increase the area under cultivation and strengthen the ability to reach a greater number of smallholder farmers. The net result is to multiply the positive impact in the region, and across Brazil more widely.

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### Notes

i. In addition to the rural partnership contracts, INOCAS pays 350 Brazilian reais a month per hectare for the use of the land, to support smallholders prior to the first crop produced. (The amount is reduced after two years; at that point, macaúba seedlings will have grown sufficiently to avoid being eaten by cattle.)

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### About

This case study is part of an effort by the Smallholder and Agri-SME Finance and Investment Network (SAFIN), the Inter-American Development Bank (IDB) and the Organization for Economic Co-operation and Development (OECD) to document the use of blended finance to strengthen agri-SME finance supply.

### Contact details

Bettina Prato  
Senior Coordinator, SAFIN  
[b.prato@ifad.org](mailto:b.prato@ifad.org)

Yuri Soares Dillon  
Unit Chief, IDB Lab  
[yuris@iadb.org](mailto:yuris@iadb.org)