CIF CLIMATE INVESTMENT FUNDS

# BUILDING A SUSTAINABLE MACAUBA-BASED SILVOPASTORAL SYSTEM AND VALUE CHAIN IN BRAZIL

CASE STUDY SUMMARY - MAY 2020

## DEVELOPMENT CONTEXT

*The project is implemented in the Cerrado region in Brazil. This region, which is a biodiversity hotspot suffers from high deforestation rates. Furthermore, smallholder farmers are increasingly exposed to the negative impacts of climate change from heat, drought, worsening soil fertility, and other socioeconomic impacts. Also, local harvest workers face seasonal unemployment due to a lack of jobs during the low season for coffee production, reducing incomes and making the population migrate to other areas.*

### THE MACAUBA PROJECT

This case study examines a project to develop a macauba-based silvopastoral[1] system and value chain in Brazil. The project was funded in part by the Climate Investment Funds' (CIF) Forest Investment Program (FIP) through the Multilateral Investment Fund of the Inter-American Development Bank (MIF/IDB) Lab.

The macauba palm tree, native to Brazil, is a productive, oil-producing plant with high potential for biofuel production, especially in dry tropical regions. The macauba tree could produce oil to sustainably meet rising Brazilian and global biofuel demand without the need for clearing more land, and without reducing pastures for cattle grazing. Also, the macauba offers a complementary income for coffee harvesters in the region, as the macauba harvest (October to January) takes place after the coffee harvest.

The project's executing agency is a private start-up company called INOCAS, a spin-off from a European Union-funded research project on biofuels for the airline industry. After a successful feasibility study between 2012 and 2014, the project started implementation in 2017.

The project intends to establish 2,000 hectares of silvopastoral macauba plantations with 300 trees per hectare, collect 1,500 tons of macauba fruits per year, sequester 300,000 tons of carbon dioxide equivalent, and train 120 farmers on agroforestry systems.

### DELIVERY CHALLENGES AND SOLUTIONS

As the program was under implementation, three key delivery challenges presented, becoming limiting factors for the project's success. The executing agency, INOCAS was

## THE MACAUBA PROJECT

**PROJECT COST**
US$5,969,000 (including US$3 million from the Climate Investment Funds [CIF] under its Forest Investment Program [FIP])

**PARTNER ORGANIZATION**
Inter-American Development Bank (IDB)

**IMPLEMENTING AGENCY**
INOCAS (Private Sector)

**PROJECT DURATION**
2017–2022 (expected) with an equity investment of 8-10 year time frame

**COUNTRY SERVED**
Brazil

1 Silvopastoral systems are agroforestry arrangements that combine fodder plants with shrubs and trees for animal nutrition and complementary uses.

able to find solutions and adjust project implementation in order to overcome these challenges.

**Project finance:** The project had a total financing volume of US$6 million, of which US$3 million was non-grant funding endorsed by the FIP and initially designed as a loan. The MIF/IDB Lab was unable to find partner financial institutions on the ground to channel the loan, as the perceived risk was too high. To overcome this challenge, the MIF/IDB Lab decided to provide US$3 million to INOCAS as equity capital. This was the first time that MIF/IDB Lab used this financing mechanism with FIP funds, as other FIP projects are usually funded through loans. This solution would allow MIF/IDB Lab to directly assume the risk of the project. Furthermore, INOCAS was able to find local partners who made a total of investment commitments of over US$1 million in the project.

**Project design:** During the project design, the macauba germination rate was expected to be unrealistically high. This rate came from controlled conditions of laboratories at research centers working on the macauba plant. Once project implementation started, it was impossible to reach such high germination rates in local nurseries, which focused on large-scale production of the plant and had natural environmental conditions. This problem was compounded with a timing issue for planting. The macauba planting period runs from October until February. By the time the project started, it was already October, and there were not enough saplings to plant. To mitigate these problems, INOCAS partnered with two local universities and a local nursery, which were able to provide technical guidance and significantly increase the success rate of the seed-to-sapling process. Through the partnership with the local nursery, the project was able to secure enough saplings for the next planting season.

**Stakeholder engagement:** The project had to overcome lack of interest from local farmers and resulting low participation rates that jeopardized overall project success. Limited buy-in by farmers stemmed from previous failed attempts by other organizations to engage them in similar projects. To resolve this issue, INOCAS conducted extensive outreach to farmers to find champions who had successfully grown macauba trees and could inspire others. Through identifying and using early adopters, the project team built a critical mass of farmers interested in taking part in the project.

## ACHIEVEMENTS

While it is still underway, this FIP-funded project has established the first sustainable macauba-based silvopastoral agroforestry value chain in the world. As of March 2020, the project achieved 502 hectares planted with macauba trees (133,944 macauba trees planted), 26 farmers trained on agroforestry and silvopastoral systems and 207,000 tons of macauba fruit collected.

INOCAS is planning to scale up operations beyond the FIP intervention. The goal is to expand beyond the 2,000 hectares starting in year six, and to expand by 1,000 hectares per year after year six with its own cash flow. INOCAS also intends to raise additional finance to build its own macauba processing factory, In the long term, the objective is to become a large-scale supplier of an environmentally friendly substitute to palm oil for the Brazilian market.

## CONCLUSIONS AND LESSONS LEARNT

The macauba project encountered some unexpected delivery challenges during implementation. Yet it overcame these by making adaptive changes. For the first time, the FIP channeled an investment through a multilateral development bank—the MIF/IDB Lab in this case—by taking equity shares in a private sector project. This experience and the challenges surmounted offer lessons for developing similar agricultural supply chains in other countries.

**Blended finance can reduce investment risk:** The project presented significant risks, as the company is a start-up involved in a new business, with a little-known product that has not been attempted in the past. Blended finance is a successful mechanism to de-risk the investment and enable uptake of a new sustainable agri-business. While the project has not yet reached a mature stage of implementation, blended finance -MIF/IDB Lab reimbursable and non-reimbursable grants; equity share investments from the FIP, channeled through the MIF/IDB Lab; and a counterpart contribution through equity shares investments from local partners- is proving to be a successful resource to jump-start the macauba value chain and to de-risk future investments.

**Working with the private sector may require flexible financial instruments and innovative solutions:** Working with the private sector represents a unique opportunity to foster wider participation but also to ensure the longer-term viability of the supply chain. It is important to find flexible financial instruments that are best suited for the private sector. In this project, the MIF/IDB Lab took a bold step forward, coming up with an innovative solution and taking an equity share of a start-up company.

**Local co-investors can increase project visibility and enhance capacity:** Finding local co-investors was a key success factor for the project. These co-investors are also project partners, who have a stake in the overall project success. Their engagement and efforts to move the project results forward is especially useful, giving the project larger visibility in the region and enabling coordinated capacity

to scale-up operations. Partnering with local universities to develop a germination protocol to improve the overall success rate from seeds to saplings is key to replication in the region.

**Importance of working hand in hand with local partners:** Project implementation needs to be well suited to the local reality. In the first three years of the macauba project, this approach was essential in persuading farmers to grow the macauba tree with other crops. This is especially important in this context, as most participating farmers are small-scale and therefore need to perceive short-term benefits until the macauba trees start producing fruits.

**Importance of adaptability during program implementation:** Adaptability and flexibility during program implementation are key to tackling unexpected obstacles and enhancing the chances of overall project success. INOCAS showed leadership and resourcefulness when faced with unforeseen challenges, such as a lack of engagement from stakeholders, unrealistic germination rate at project design and a dearth of investors. The MIF/IDB Lab did the same when restructuring the financial agreement and converting the FIP investment from a loan to equity share.

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