



**Mature and innovative value chains in  
bioeconomics:  
assessing maturity and studying ways  
to improve performance - the case of  
Brazil**

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# *Introduction – the Brazilian context for biodiesel*

- The structure and governance of the Brazilian biofuel value chain are both already defined and well consolidated, based on soybean as the main raw material to the biodiesel production.
- 2004: Creation of the **National Program for Biodiesel Production and Use (PNPB)**.
  - Aim: sustainable implementation of biodiesel production and use, focusing on social inclusion and regional development.
  - Social aspect: **Social Fuel Seal – Family Farmers - alternative raw materials**
  - Greater soybean supply and competitiveness in the South and Midwest regions. Soybean dominated the market and is responsible for, on average, 70% of total biodiesel production in Brazil (ANP, 2019).
  - Concentration of mills installed in regions well developed. Distortion of the initial objectives of the Program.

# Introduction – the project

Soybean

Macaúba  
(*Acrocomia aculeata*)

Failure Cases

Socioeconomic

Environmental

Innovation  
dynamics

National and  
global  
challenges

- The main questions are:
  - Are the structure and governance of the value chains enough to:
    - ensure a regular supply of raw materials?
    - ensure sustainable management of agricultural resources?
    - ensure adequate integration of rural producers into the chain?
    - incorporate knowledge and technologies that are consistent with the values of responsible innovation, and with major national development goals and global challenges?
  - What is the impact of these chains on the local and regional economy and society?

# Mature Value Chain

## Soybean

### Social Fuel Seal



number of supplier families since 2012  
(selection process)

- What is the selection criteria?
- What are the advantages for the farmer?
- What are the impacts for family farmers?
- Is the instrument, in fact, a social policy?

### Industry idleness

In the period of 2005-2018 the plants operated, on average, with 65% of idleness.

- Planning problem?
- Necessary to ensure productive flexibility and the operation of the chain under the current governance?

# Soybean - Progress

- **July 2019:** field research in a soybean-based biodiesel plant in the city of Orlandia, state of São Paulo.
- **March 2020:** first impact assessment based on the input-product methodology comparing two Brazilian states of great importance in soy production: Rio Grande do Sul and Mato Grosso.

## Next steps:

State	City	Case
Mato Grosso	Rondonópolis	5 biofuel industries
Rio Grande do Sul	Passo Fundo Cachoeira do Sul Ijuí	4 biofuel industries
Bahia	Candeias	Petrobras Biofuel

## Innovative Value Chain

### Macaúba (*Acrocomia aculeata*)

- High production of oil per hectare
- High-quality oil
- Occurs in areas with high solar irradiation, adapts to sandy and low water content soils
- Environmentally sustainable characteristics: soil and water recovery, enables intercropping and agroforestry systems
- Participation in diversified markets, as food, cleaning products and cosmetics.
  - Opportunity for generating social inclusion and local development?



# *Macaúba: Progress*

- **August 2019: interview with biorefinery Soleá**
  - 1000 hectare planted of macaúba
  - 2 main axes: a) technological and propagation and b) planting and processing
  - Axis in development: market analysis
  - The number of markets, products and applications is a great advantage, much more than productivity
  - The energy market is not the priority: “The energy sector is not a game for a small company like Soleá, as it demands scale and intensive capital”.



# Macaúba: Progress

- February 2020: 3 case studies

## Macaúba project of the forest zone

Created in 2012 the project is aligned with regional environmental policies and the Sustainable Development Goals (SDGs).

Objective of becoming the first sustainable chain, with assets linked to carbon credits.

- Recovery of water sources (partnership with the National Water Agency)
- Aviation fuel supply
- Local and Regional development strengthening family farming

## Entaban

First financed project of Macaúba in Brazil.

Macaúba production started in 2008 in partnership with a Spanish Enterprise – the Entaban Group.

“Failure” case – the company bankrupt with the 2008/2009 crisis and the producer had to pay the debts.

In that period there was a lack of policies aimed at macaúba development.

## Experimental Farm and Macaúba Research Network (Remape)

Project created in 2011, coordinated by the University of Viçosa in partnership with the private sector

- Germplasm bank (selection of the species, cloning)
- Farm with 15 ha planted (species from different qualities)
- Experimental mill - research and not scale goals

# *Macaúba - first observations*

- Extractivism is still the predominant form of economic exploitation
- Changing the type of exploration presents technological, economic and financial challenges
- High investments needed and very slow payback period
- High costs to convince family farmers to plant macaúba for biodiesel production (demands change of local culture - which is based on extractivism)
- Macauba oil is very noble.

## **Next Steps:**

Inocas (City of Patos de Minas)

Cooper Riachão (City of Mirabela)

Is there opportunity for inclusion or will the large scale production dominate?

Is the biodiesel sector the best choice to harness the potential of macaúba?

*Thank you!*

