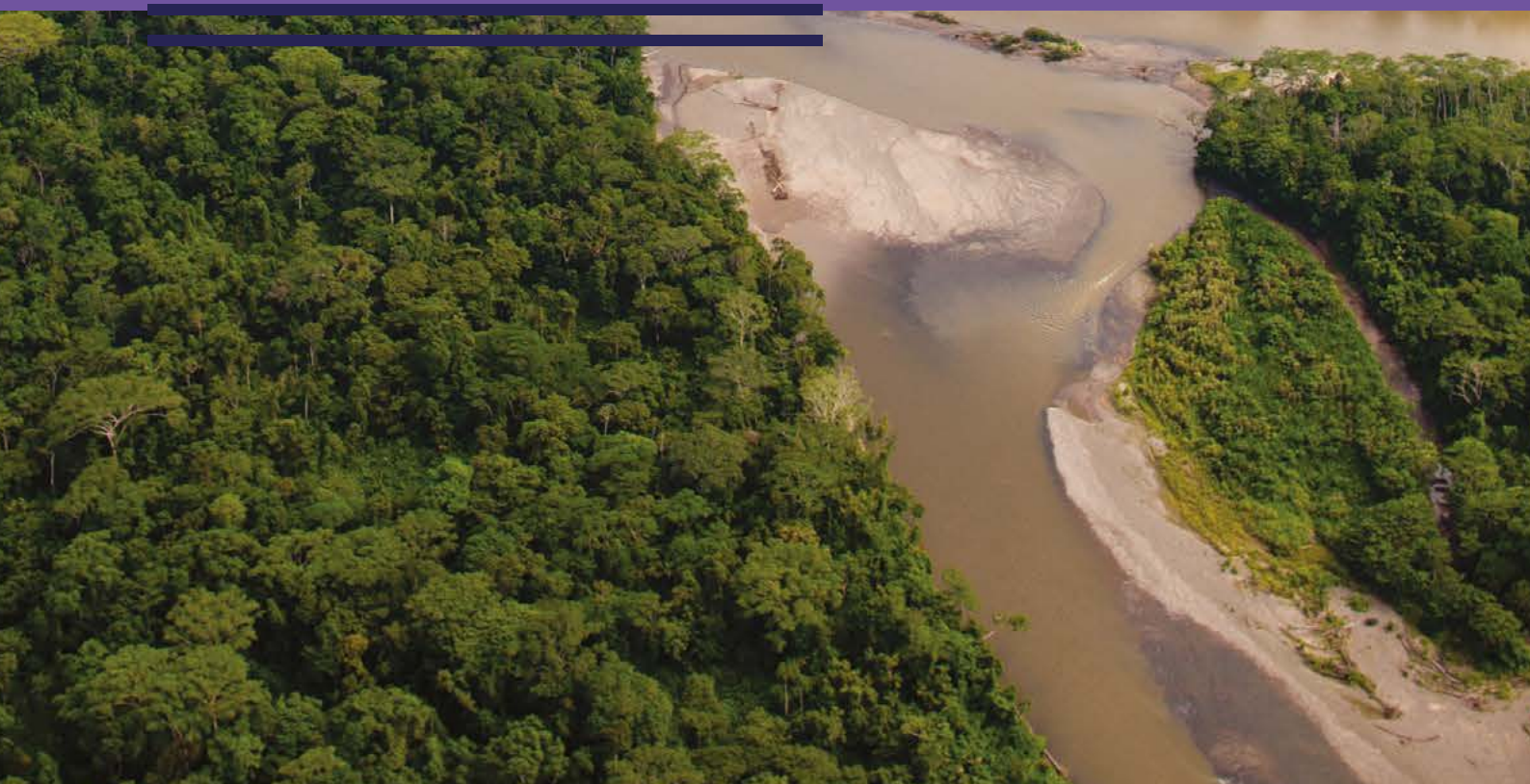


# **Agrifood chains and the challenges of combating deforestation:**

Stakeholders, regulations, markets and strategies





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# Presentation

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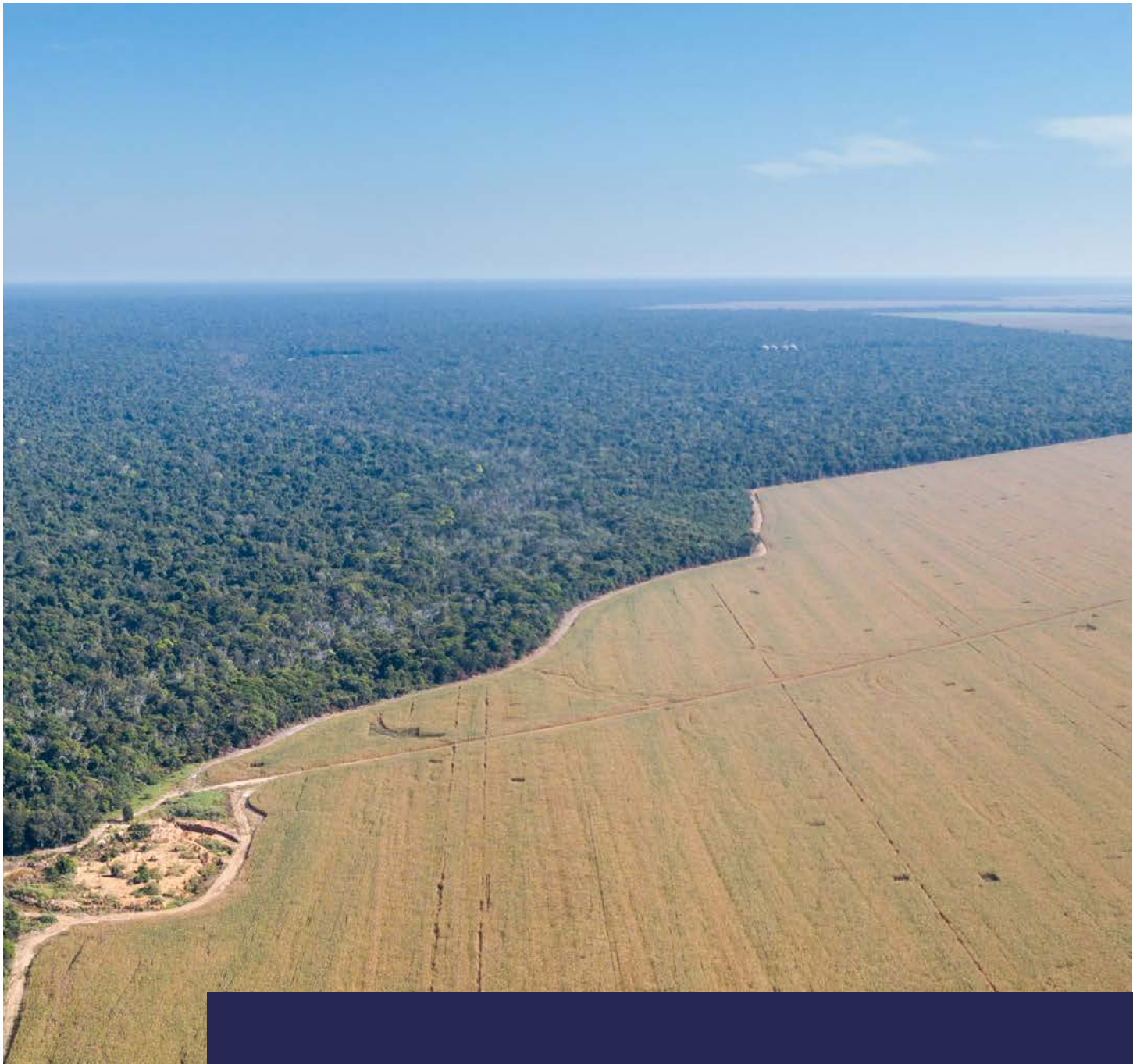
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This study, conducted through a partnership between the Brazilian Business Council for Sustainable Development (Cebds) and Imaflora (*Instituto para o Manejo Florestal e Agrícola*), with support from Nutrien, intends to increase knowledge about the functioning dynamics of some agrifood chains and their relationship with deforestation. At the same time, it aims to better understand how the different links of some chains most exposed to this problem have sought to disassociate deforestation from their supply chains.

The relevance of this type of study is in providing new findings on the expansion tendency in production that will be acquired by the industries, and on how the interactions that have been occurring, throughout the chains and around them, have provided paths to productive sustainability and what limits still need to be overcome to provide the solutions.

Have a good reading!





# Introduction



**Food systems involve elements and activities related to food production, processing, distribution, preparation, consumption and disposal, influenced by political-economic, infrastructure, technology and innovation, beside critical socio-cultural and environmental aspects. The food we eat reaches our plates through supply chains, which can be long or short. Each step in these chains requires human and natural resources. Considering the interdependence of the different links that make up food supply chains, note that if one part is affected, all or a good part of it will suffer the effects, directly or indirectly, which often manifests itself as changes in prices or in the legitimacy or social acceptance of the product.**

The history of the development of agrifood chains around the world does not occur without social and environmental impacts. The expansion of crop and livestock production has occurred by increasing productivity, opening up new areas, converting native vegetation, and simplifying animal diversity. As a result, negative effects occur such as water contamination and water scarcity, biodiversity loss, and soil impoverishment (Fearnside, 2005; Hunke et al., 2014; Bolson, 2018; Abramovay, 2021). These natural capitals, once lost, will also affect the very production of the raw materials that will be transformed into food by the various links that make up the agrifood chains.

In tropical forest regions, deforestation is the most noticeable effect, since it is directly related to climate change. Data from the Greenhouse Gas Emissions Removals and Estimates System (SEEG, 2021) shows that the sector associated with land use alone accounts for 46% of gross emissions

(998 MtCO<sub>2</sub>e) of Greenhouse Gases (GHG), while agriculture and cattle raising represent 27% of gross emissions (577 MtCO<sub>2</sub>e). Between 1985 and 2021, Brazil lost 13.1% of native vegetation, among forests, savannas and other non-forest formations (Mapbiomas, 2022). Moreover, the scientific literature on the subject shows a relationship between the advancement of agricultural commodity production and increased suppression of native vegetation, largely illegally (Guedes Pinto et al., 2020; Rajão et al., 2020; Reis et al., 2020; Vasconcelos et al., 2020).

But, if on one hand there is urgency to stop deforestation and combat climate change, on the other there is great concern about agricultural production and food safety. The increase in hunger is a fact, aggravated by pandemics, the disarticulation of food security policies, and the recent global political-economic crisis. Therefore, it is important to shed light on the strategies mobilized by different links in some key agrifood chains in the Brazilian context

and their initiatives to tackle deforestation. And to show how these links have interacted, or not, to solve the problem, given the commitments Brazil has made to its international peers. Thus, the questions that guided the research were:

- What is the spatial and temporal pattern of expansion of the crops analyzed in the study? And what are the dynamics between the increase in productivity and the expansion/reduction of the area?
- How are the agrifood chains focused on in the study set? What are the links that make up these chains and how do they act and interact regarding deforestation?
- What are the regulations to combat deforestation that affect these chains, and what are the market trends?
- What are the sectoral agreements and corporate experiences in combating deforestation, and to what extent have they



been efficient? What are the points of attention highlighted by civil society organizations?

## PROCEDURES OF THE STUDY

This study focuses on some agrifood chains<sup>1</sup> using two criteria of choice: i) the chains most exposed to the deforestation/conversion issues of native vegetation, and not only in the Amazon biome and, ii) the chains that can exemplify new forms of interaction to achieve greater sustainability and low carbon agriculture. Thus, we chose to focus on the agrifood chains of soybean and corn, coffee and beef cattle ranching.

The study relies on two analytical approaches. First, seeking to understand the dynamics between productivity increase and area expansion (Jevons effect), or productivity increase without area increase (Borlaug, or land sparing effect). For this, a **geospatial analysis** was conducted using the 1995, 2006, and 2017 Agricultural Census database (for spatialization of agricultural crops) and pasture data from Lapig (Image Processing and Geoprocessing Laboratory)<sup>2</sup> at the Federal University of Goiás (for spatialization of cattle ranching). This step involved: a) the selection of crops: i) family farming; ii) non-family farming; iii) hybrid farming; b) analysis of the effects of productive intensification through visual analysis (looking for specific patterns of area savings (Borlaug effect) or area expansion (Jevons effect),

at the mesoregion level. For more details on the methodology used in this first approach, see [Annex I](#).

For a second view, a **qualitative analysis** was adopted that involved: a) a systematized review of the literature on: i) the relationship between agrifood chains and deforestation, and; ii) the regulations and sectoral agreements to combat deforestation that affect these chains; and, b) semi-structured interviews with key stakeholders belonging to the different links of the value chains of beef cattle, soy, corn, and coffee. For more details on the methodology used in this second approach, see [Annex II](#).

This document is structured in three parts. The first part presents the results of the geospatial analysis, offering a view of the dynamics of area expansion and productive intensification of selected agricultural crops and livestock in the Brazilian territory over the last three decades. The second part brings the configuration of the analyzed agrifood chains and the main regulations that affect the fight against deforestation, showing market trends. The third and last part presents the strategies and interactions of the stakeholders in these agrifood chains, showing the emblematic cases of soy, beef cattle raising and regenerative agriculture as an alternative.



<sup>1</sup> In particular soybean, corn, coffee and beef cattle. Additionally, data from eleven crops were analyzed: sugarcane, beans, rice, cassava, tobacco, bananas, grapes, wheat, cotton, sorghum, and oranges.

<sup>2</sup> Available at <<https://atlasdaspastagens.ufg.br/>>.



Part

1

The overview of the  
chains from a geospatial  
point of view



## DINÂMICAS DE EXPANSÃO

### EXPANSION DYNAMICS

When looking at the Brazilian territory, what is the overview regarding the expansion and retraction of the area of some very important crops and productive systems in the agribusiness agenda? What is the spatial cutout adopted?

Three sets of agricultural crops were established: a) the most relevant for Family Farming; b) the most relevant for Non-Family Farming, and c) those relevant for both, called Hybrid, and Cattle Raising, according to the following criteria:

- **Relevant to Family Farming (FF):** cassava, tobacco, banana, grapes.

The criterion used for the selection was the **production value**. The percentage of the production value of each crop/product was calculated regarding the

total production value generated by temporary and permanent products.

- **Relevant to Enterprise Agriculture (Non-FF):** wheat, herbaceous cotton, sorghum, orange.  
  
The criterion used for the selection was the **harvested area**. The percentage of harvested area of each crop/product was calculated regarding the total harvested area used for production of temporary and permanent products.
- **Hybrids:** soybeans, corn, sugarcane, beans, rice, coffee.  
  
Relevant crops both in terms of production value (for FF) and harvested area (for Non-FF).

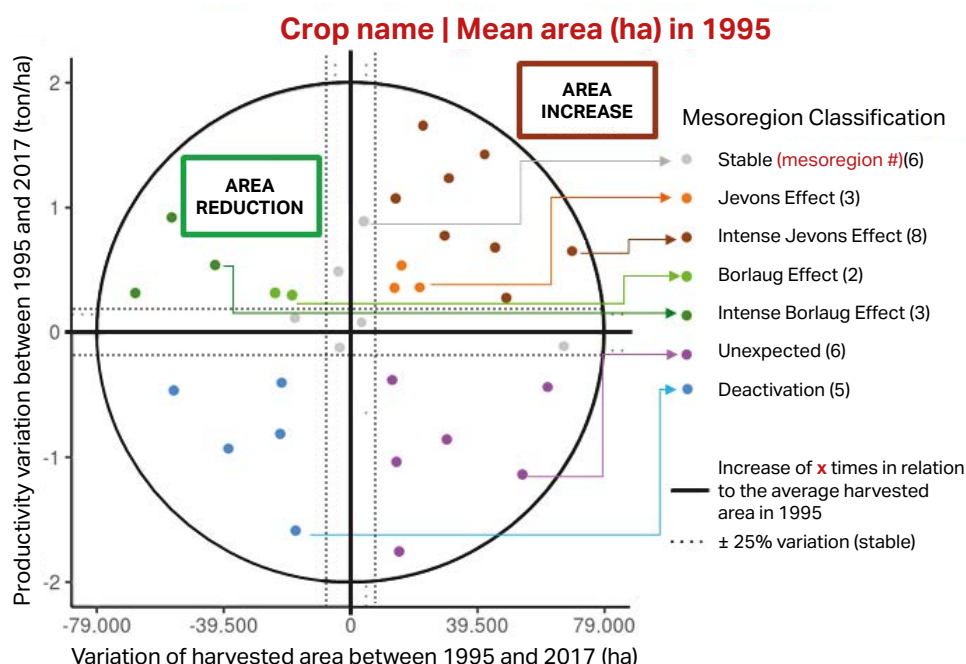
#### Analysis of the selected crops

Given this scenario, what is intended is to understand how the dynamics of expansion and retraction of areas, allied or not

to the production intensification occurred in the Brazilian territory between 1995 and 2017, and to quantify the areas that increased and that were saved, by crop, in the mesoregions that showed an increase in productivity in the period. The study brings a specific look at individual crops and cattle farming, highlighting the Jevons and/or Borlaug effects for those that occurred in the territory. To assist in the geospatial analyses, scatter plots and a map were generated for each agricultural crop and cattle ranching, at the mesoregional level. Note that the graphs show how many mesoregions are classified in each quadrant (see complete methodology adopted in [Annex I](#)), and each point represents a mesoregion.

To show how the data are presented, we show below a fictional example of the results with explanations of the meanings of the symbols and legends used. On the x and y axes are the variation in area

FIGURE 1. INTERPRETING THE SCATTER PLOT

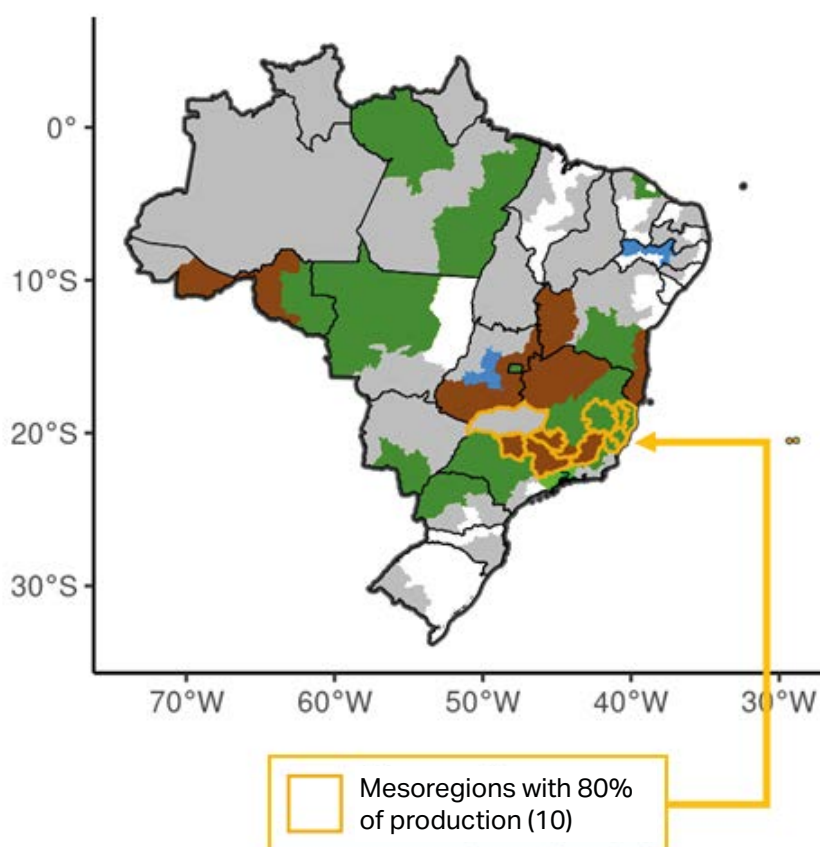


and productivity. These graphs indicate in the header the name of the crop analyzed and the average harvested area in the year 1995 (average free of outliers<sup>3</sup>). The dispersion of the points indicates the observed effect. Since seven situations are possible, seven different colors were used for each effect. The keys of the graph "mesoregional classification" indicates the number of mesoregions classified in each situation. The keys also informs the proportion of the area increase that occurred between 1995 and 2017 limited by the largest circle, having as a parameter the average harvested area in 1995 (figure 1). Note that the x and y axis limits do not represent the maximum observations for each variable, as discrepant points were eliminated by cleaning outliers (see [annex I](#) for more details).

Considering that the objective here is to understand the dynamics of expansion and retraction of areas, allied or not to the intensification of production in the mesoregions that presented an increase in productivity, we must look at the green and orange/brown mesoregions, as these are the areas where there was an increase in productivity in the period.

Knowing that in these mesoregions occurred the increase in productivity concomitant with the increase in area (Jevons effect) or the increase in productivity linked to the decrease in area (Borlaug effect), we still need to know how much was the aggregate increase or decrease in area.

FIGURE 2. INTERPRETATION OF THE SPATIAL DISTRIBUTION OF EFFECTS ON A MESOREGIONAL SCALE.



Thus, a box in the 'Borlaug effect' quadrant indicates which area was reduced and a box in the 'Jevons effect' quadrant indicates the area expanded in the period, for each crop.

Looking at the maps, the colors green, orange, and brown indicate the mesoregions in which there was an increase in productivity, the focus of the analysis. To observe the spatial effect on the main producing mesoregions, the mesoregions that concentrate 80% of the national production of the analyzed crop were highlighted (in yellow). The number in parentheses in the keys indicates the number of mesoregions that concentrate 80% of Brazil's production (figure 2).

## RESULTS

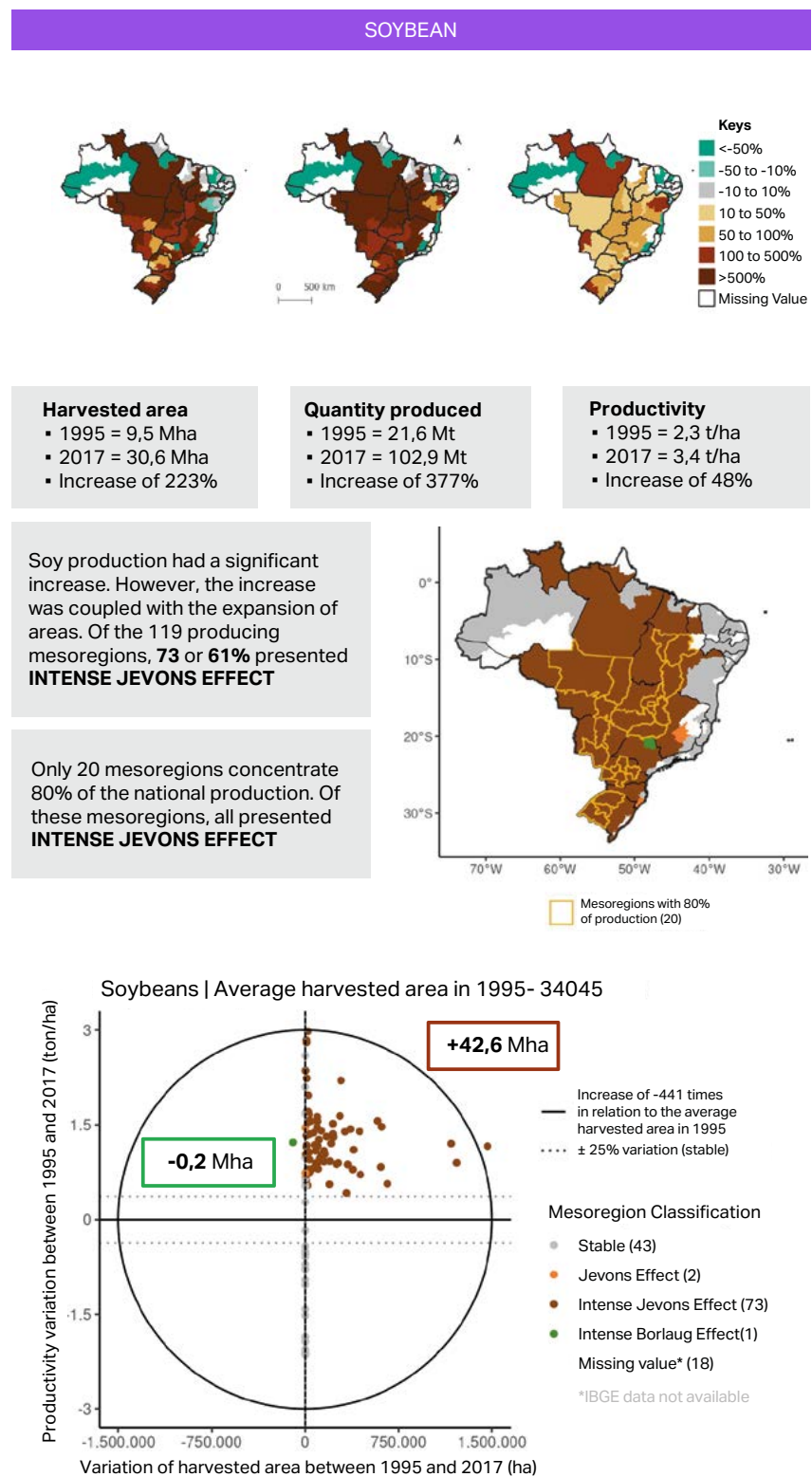
Generally, in an overview, between 1995 and 2017, according to the IBGE Agricultural Census, 13.5 Mha were incorporated into crops and pastures, which is equivalent to a rate of 0.6 Mha.year<sup>-1</sup>. So, even with the large increase in productivity observed in recent decades, the incorporation of land for agricultural production still occurs in Brazil, leading to the conclusion that the processes of area expansion and productive intensification occur simultaneously in the territory.

In some crops, such as soy, the dynamic of expansion prevails throughout the national territory and for crops such

<sup>3</sup> In statistics, an outlier, or atypical value, is an observation that is far away from the other observations in the series, or inconsistent. Typically, the existence of outliers implies damage to the interpretation of the results of statistical tests applied to the samples.

as cassava and beans, the processes of expansion and intensification of areas and productivity are distributed in a very heterogeneous manner both spatially and temporally. Beef cattle raising, on the other hand, presents a differentiated process of expansion/retraction and intensification/extensification dynamics combining, in frontier regions, expansion associated with reduction in productivity, an aspect not observed in the other crops analyzed.

The general observation that expansion and intensification occur simultaneously, we can understand the aggregate dynamics of the process, but is not very instrumental for the analysis of specific processes of some crops in certain territories, such as the regional transfer of crops. This detailing – presented and discussed in this report – can help in the definition of actions linked to the territorial dynamics of expansion/intensification aimed at reducing the expansion of agriculture and cattle ranching on land covered with native vegetation. Based on the information presented, on the data reading format, the maps with the focus crops of this study are shared below: soy, corn and coffee, classified as hybrid agriculture, and the cattle raising map. The results of the other crops can be found and checked in [Annex I](#).

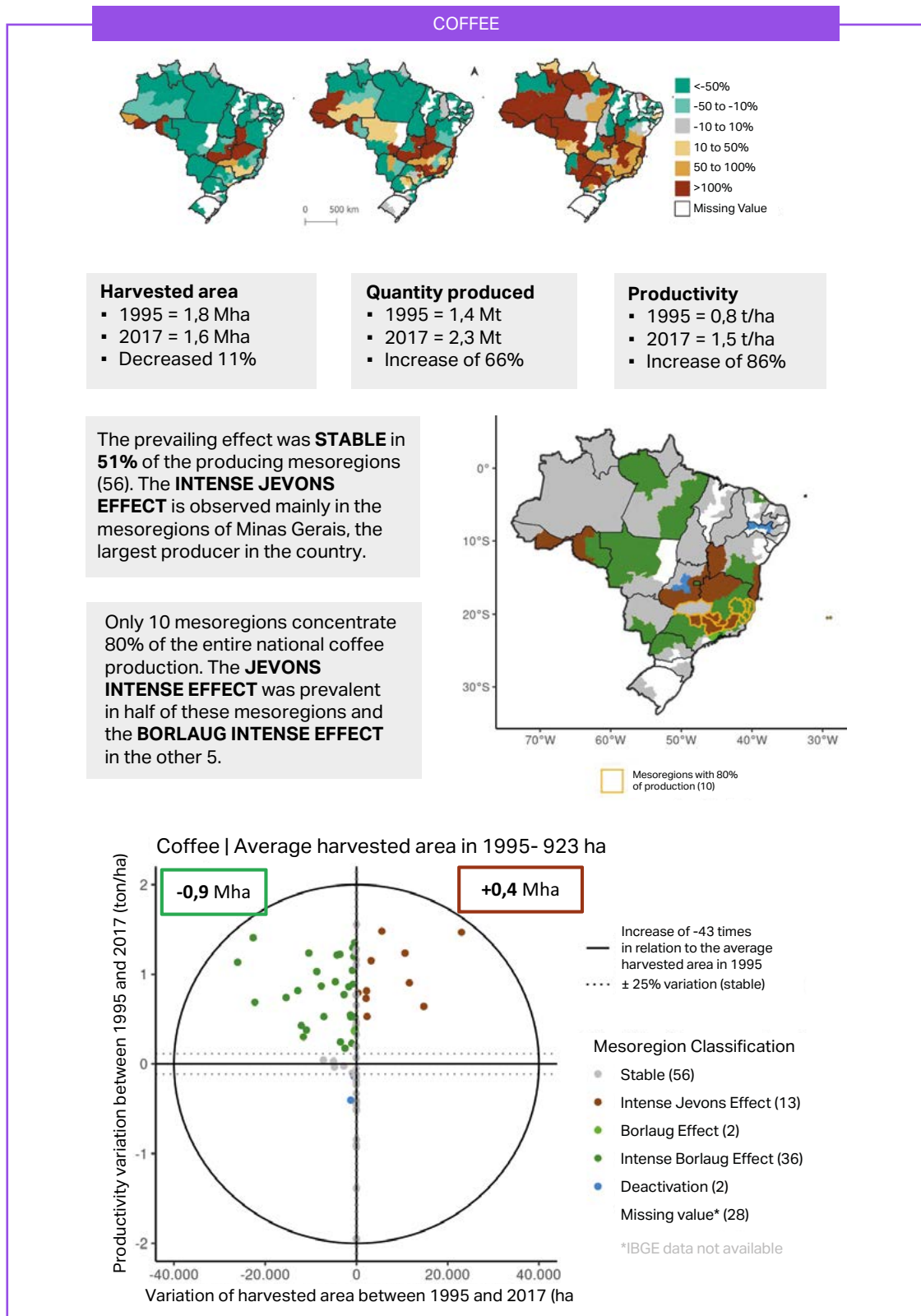




In the case of soy, the Jevons effect, which involves increased productivity with the expansion of areas, occurred over most of the country, especially in the frontier areas between Cerrado and Amazon, and in the Center-South regions (see

brown/orange colors of the map above). Note that the expansion of areas is not synonymous with deforestation, as in this analysis we do not consider under what type of area the expansion took place (native vegetation or area already occupied by agriculture).

In the case of corn, the Jevons effect also occurred in the frontier areas between Cerrado and Amazon, and in the Center-South regions. But, unlike soy, there was a large occurrence of the Borlaug effect, especially in the South of the country.



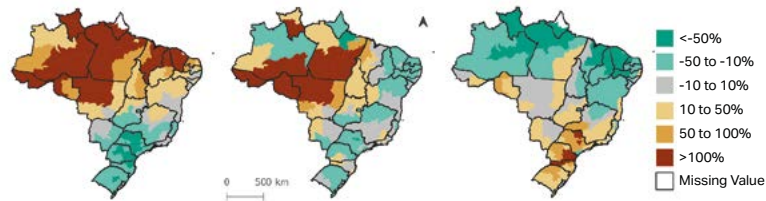
In the case of coffee, the Borlaug (land sparing) effect is more present. But, when we consider the most productive mesoregions (areas with a yellow outline) the dynamics are mixed, with expansion in the southern portions of Minas Gerais, but

less in the regions between western Minas Gerais and Espírito Santo.

In cattle raising, the dynamics between productivity and expansion remained stable in most of Brazil. However, note the

unexpected effect (purple color on the map), as in areas already consolidated and with greater intensification, land savings occurred (Borlaug effect). While in frontier regions, where cattle ranching is extensive, there was expansion of areas (Jevons effect).

#### BEEF CATTLE BREEDING



##### Harvested area

- 1995 = 105 Mha
- 2017 = 153 Mha
- Increase of 45%

##### Quantity produced

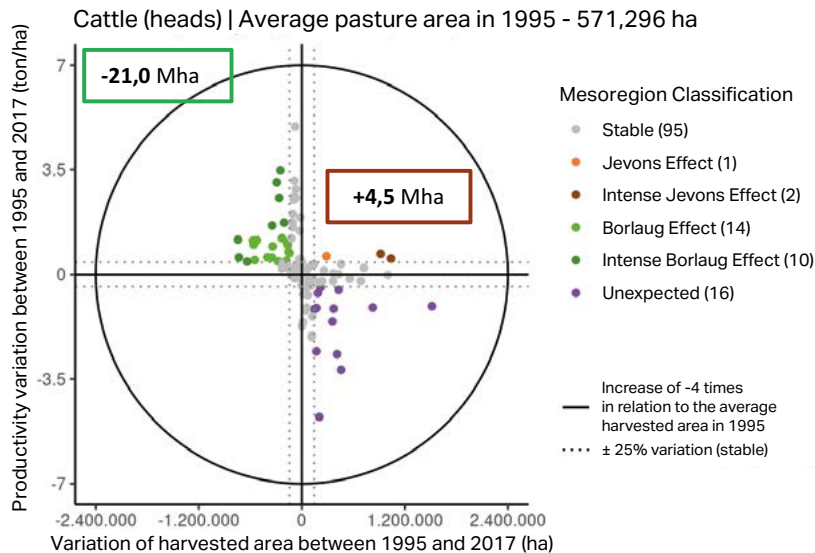
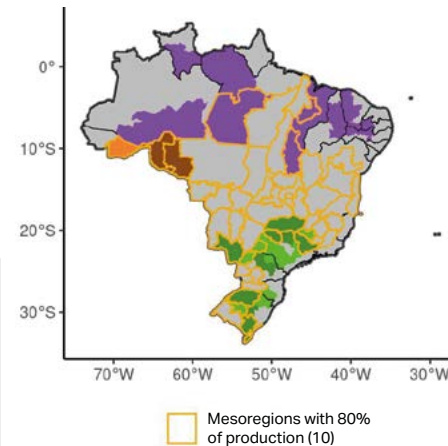
- 1995 = 153 milhões
- 2017 = 172 milhões
- Increase of 13%

##### Productivity

- 1995 = 1,45
- 2017 = 1,53
- Increase of 6%

The **BORLAUG EFFECT**, both intense and non-intense, prevailed mainly in the mesoregions of the South and Southeast regions. The hypothesis is that in these regions the expansion of areas for this activity has no more space and, thus, intensified saving area.

In the North and Northeast regions, **DISACTIVATION** was prevalent, indicating the expansion of areas (probably through the deforestation of native vegetation) even with the decrease in productivity (there was no increase in the relevant bovine effect)



When we look at the spatial dynamics of the production of the agricultural crops analyzed here, and of cattle raising, what we see is that there has been an expansion of the productive areas, regardless of being FF or Non-FF (see [Annex I](#) for details).

In other words, there are more common elements between the crops linked to FF and Non-FF than differences, and the Jevons effect indicates this. **Thus, if there is area available to expand agricultural production, it will be expanded.** On the other hand, it was also observed that in areas where Borlaug effect, or land sparing, occurs, the crops have greater technology, which directly influences the increase in productivity. But, this does not mean that there is a relationship between increased productivity and reduced deforestation. Cattle-raising is an example of this, since in the already consolidated areas, the activity is intensified and generates the land-saving effect. **Whereas in frontier regions, where cattle raising is extensive, the behavior is one of expansion. And even with low productivity, it still ends up being economically viable to convert native vegetation.**

## MAIN CONSIDERATIONS

The geospatial analysis generated three important findings. The first one concerns the **non-relationship between the Jevons effect (with an increase in area expansion) and the Borlaug effect (with area saving), and the profile of rural producers.** I.e., there is no differentiation between FF and Non-FF (see [Annex I](#) for details),

but rather in the way agricultural crops are concentrated in the mesoregion. In the mesoregions that concentrate 80% of production (high productive efficiency), there is a predominance of the Jevons effect. In other words, there is an increase in productivity, but with the expansion of production over other areas.

Based on this finding, you note that the profits from agricultural production are reinvested in the activity, aiming both at increasing efficiency - technology, labor qualification, and management models - and at its expansion. In this way, the producing region specializes, increases productivity and, consequently, expansion. In contrast, in resilient crops – as cassava – the pattern is quite different. Often, production is kept active as a result of income from non-agricultural sources, but from government social benefits, for example. Faced with this scenario, we also observe, on one hand, the continuous growth of competitiveness – via the Jevons effect – but on the other hand, the process of deactivation that affects the vast majority of rural establishments in Brazil.

At the regional or national level, the negative effects of this process (predominance of the Jevons paradox effect in specialized regions and area reduction – under different effects – in non-specialized regions) include the environmental impacts resulting from the expansion of areas over native vegetation (deforestation), productive deactivation of rural properties associated with the concentration of land and means

of production, and the reduction of the area of non-specialized crops (with or without reduction of crop variety). The level of public interference should be adjusted so that agricultural production continues to have as the basis for its development the incorporation of new technologies (productivity and efficiency gains) and its concentration in regions where these technological gains can have the greatest effect (Jevons paradox), provided that, along this path, the negative effects are controlled or efficiently compensated by means of incentives or subsidies, taxation or regulation.

Therefore, the question is, how to reduce these asymmetries?

The second observation is related to the **reallocation effect of some crops in the territory**, especially staple foods. There is a tendency that areas with crops that present stable demand are transferred to places where increased production is more profitable. An example is beans, which moved from the South of the country to the Mid-West, where productivity is higher, making the product more competitive. Unlike soy, which has infinite demand, and in where we can see the Jevons effect.

In the case of beans (see [Annex I](#)) the production is aimed only at the domestic market. The quantity produced in 1995 was the same as in 2017 (2.1 Mt), productivity doubled (from 0.5 t/ha to 1.1 t/ha) resulting in a decrease in the area cultivated in 1995 from 4.1 Mha to 2.0 Mha in 2017. Even with the reduction of the production area



by half – reflected in a reduction of the area in several regions (south, southeast and north) – in the mid-west region the area increased significantly. Beans, previously produced on a small scale by FF in several regions of Brazil, mainly South and Southeast, have migrated under the central pivots in the Midwest region. In the regions that concentrate 80% of production, part follows the Borlaug effect (South and Southeast regions) and part Jevons (Mid-west). In the South and Southeast regions there was simultaneously the incorporation of technology (increased productivity) and a significant reduction of area due to the migration of production to the Mid-West, which expanded the area of bean production with increasing gains in productivity. The areas that stopped producing beans in the South and Southeast partly migrated to other crops that expanded there (soy for example) or contributed to the deactivation of these properties. Here, the main factor to understand the dynamics of expansion is the demand. In areas/regions where consumption is not so expressive, compared to other crops, that crop ceases to be economically interesting, and

ends up migrating to another place, where high productivity makes the product more interesting. In these cases, it is common for the area/region previously occupied with staple foods to be replaced by other more profitable crops (generally soy).

The third and last one concerns **cattle raising, which has a very particular expansion dynamic**. It intensifies only in consolidated areas, but becomes more extensive in frontier regions. The Jevons effect is not observed as cattle ranching has this characteristic of extensification without increasing productivity. The stable effect is observed as there is still land for expansion. However, the trend is that over time the Borlaug effect will be observed.

The South and Southeast regions were the ones that experienced intensification of cattle ranching, with high technology, and saw the land-saving effect. In contrast, when looking at the specialized cattle ranching data, we note that the 'windfall' effect is associated with the idea of land production especially in the North and Northeast regions.

On the frontiers of the North and Northeast regions the windfall effect can be explained by the combination of two activities. The opening of new areas (deforestation), legal or illegal, on private or public lands to increase their value (land production), which is combined with their occupation by beef cattle ranching. In the case where land production is more profitable than cattle ranching or occurs at a greater intensity, we will have a greater production of land than the capacity or willingness to occupy it with cattle ranching. The result of this combination is the unexpected effect for ranching, i.e., an increase in area with a decrease in productivity

As long as there is available land, agricultural production will expand and occupy these areas. Where the "unexpected" effect occurred, "land was produced". This is a topic that has been discussed a lot, since land is seen as an asset, and has even been considered more interesting than cattle. It should be explored, within the scope of public policies, what are the limits so that expansions are not made in a systemic way, but considering what can best bring return to the territory.



That the profits from agricultural production are reinvested in the activity, aiming both at increasing efficiency - technology, labor qualification, and management models - and at its expansion.





# Part 2

**The agrifood chains  
facing the deforestation  
issue: stakeholders,  
regulations and trends**



## INTRODUCTION

The geospatial look, and the conclusions of the analysis of the effects of the expansion and intensification of some agricultural crops included in the first part, allows us to reveal the dynamics of the occupation of the territory. The main conclusion is that, even with the large increase in productivity observed in recent decades, the incorporation of land for agricultural production still occurs in Brazil, leading to the conclusion that the processes of area expansion and productive intensification occur simultaneously in the territory. If land is available, the production area will tend to expand. The case of cattle raising is emblematic. As the analysis shows, it intensifies only in consolidated areas, but becomes more extensive in frontier regions. The Jevons effect is not observed as cattle ranching has this characteristic of extensification without increasing productivity. The stable effect is observed as there is still land for expansion. However, the trend is that over time the Borlaug effect will be observed.

Agricultural expansion is recognized as a major driver of forest loss in the tropics. However, accurate data on the direct link between agriculture and tropical deforestation is

lacking. Pendrill et al. (2022) synthesized existing research and datasets to quantify the extent to which tropical deforestation from 2011 to 2015 was associated with agriculture. The authors estimated that at least 90% of deforested land occurred in landscapes where agriculture caused forest loss, but only about half was converted to land with agricultural production. Data availability and trends vary from region to region, suggesting complex linkages between agriculture and forest loss, including the expectation of valuation that will ultimately depend on the income to be generated from the use that will be put to the area that has been cleared.

The authors conclude that – although they play an important role – public and private initiatives that try to eliminate deforestation in producing countries from their supply chains have limited capacity. Between one-third and one-half of deforestation does not occur on actual agricultural land under production (Pendril et al., 2022). Moreover, most – about three-quarters – of the expansion of agriculture into forests is driven by domestic demand in producing countries, especially for beef and cereals, including much of the deforestation across the African continent

(Pendrill et al., 2022). This data suggest that the potential for international measures to regulate supply chains, especially for commodities, to help reduce tropical deforestation is complementary but not sufficient. According to the authors, the necessary effect on reducing deforestation is more likely to be achieved through interventions in deforestation risk areas that focus on strengthening sustainable rural development and territorial governance. For such an outcome to occur, you need to understand how public and private stakeholders along the chains have interacted – and how they have been pressured – to design and implement possible solutions. The next sections seek to shed light on these relations, presenting important theoretical approaches that deal with the dynamics between deforestation and agricultural production, especially of commodities.

## INTRA AND INTER-STAKEHOLDERS RELATIONS IN AGRIFOOD CHAINS

The analytical strand of thought called AFS - Agrifood System, developed by researchers from PENSA - Agrifood System Business Studies Program of the University of São Paulo, is quite useful for the purposes of this



study. This approach adheres to the concept of productive chains, but involves other elements besides the vertical chain, such as the institutional and organizational environment (Castro, 2001).

Zylbersztajn (2000) highlights the distinction between chains and agrifood system, considering the latter as a broader concept, which involves the institutional environment and the support organizations. From this point of view, the author reveals that the AFS is seen as a set of contractual relations between companies, whose objective is the dispute of the consumer for a certain product. Therefore, the AFS can be seen as a flow, supported by the institutional environment, which are the rules of society represented by laws, traditions and customs, and by the organizational environment, which

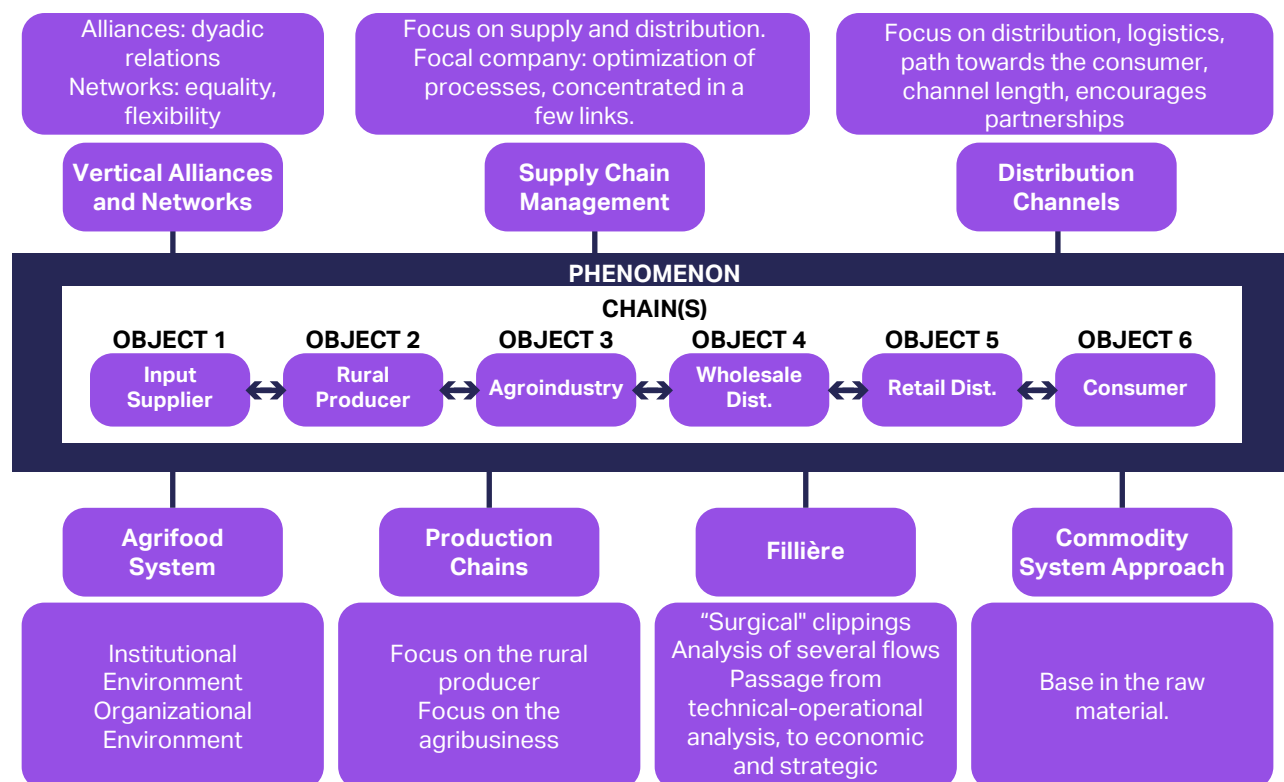
are structures created to support the functioning of the AFS.

In this logic of thought, an effort is being made to define a conceptual proposal for the agrifood system, incorporating elements that allow a better understanding and analysis of agribusiness organizations. The agents that act in the AFS maintain a relationship of cooperation and competition, whose relationships change over time, either due to external aspects or to changes in technology. For Zylbersztajn (2000), this network of relations cannot be understood as linear, but as a network of relations composed of various agents that maintain contacts among themselves, and the improvement of these relations can make the architecture of the agrifood system more or less efficient.

### Deforestation dynamics and agricultural production

Brazil plays an important role in the production and export of agricultural commodities. In the space of a few decades, the country went from being a deficit producer of food to becoming one of the largest exporters in the world (Vieira et al. 2019). However, the performance of this agrifood system has cost the increasing expansion of agricultural frontiers over huge areas of native vegetation, causing not only deforestation, but other environmental impacts just as serious (Abramovay, 2021), such as water scarcity and river silting (Fearnside, 2005; Hunke et al., 2014; Bolson, 2018; Guidotti et al, 2020), pesticide contamination (Bombardi, 2012; Pignati et al., 2017; Rekow, 2019), loss of pollinating insects (Priess et

FIGURE 3. REPRESENTATION OF THE VARIOUS LINES THAT STUDY THE CONFIGURATION OF AGRIFOOD CHAINS.



Adapted from Pedrozo, et al. (s/d)

al., 2007) and endemic species that depend on ecosystems to reproduce and feed (Vynne et al., 2010; WWF, 2015), and reduced carbon stocks due to biomass loss (Salati & Nobre, 1991; Nogueira et al., 2018; Roitman et al., 2018; Silva, 2018). Besides the environmental effects, the advance of commodity production also generates socioeconomic impacts such as the high concentration of financial and land resources (Pita, Boechat & Mendonça, 2017; Favareto et al., 2019; Guedes Pinto et al., 2020; Rajão et al., 2020). This dynamic of wealth concentration has a notable impact on the regional development of producing municipalities (Heredia, Moreira & Leite, 2010), which become islands of production with a not very dynamic and diversified economy (Favareto et al., 2022; World Bank, 2021).

The literature review on the agrifood chains selected for this study showed that there are two important narratives that are related to the relationship between agricultural commodity production and deforestation. The first reinforces that you do not need to expand agricultural activity to new areas, but rather occupy those that have already been converted, especially degraded pasture areas. The studies that support this narrative question: i) the efficiency of current policies and highlight the fragility of Brazilian environmental legislation, such as the Forest Code (Sparovek et al., 2012; Trase, 2019; Rajão et al., 2020); ii) the monitoring of areas where agricultural activities occur (Fearnside, 2005), and; iii) the insufficiency

of market mechanisms, such as the Soy Moratorium in the Amazon (Carvalho et al., 2019; Lima et al., 2019; Waroux et al., 2019). In this sense, several researches have reinforced the need for policies that encourage and require the reduction of deforestation tied to more efficient mechanisms of traceability and transparency of the value chains of commodities such as soy and beef (Fearnside, 2005; Angelsen, 2010; TNC, 2019; Ferguson, Sekula & Szabó, 2020; Rajao et al., 2020; Reis et al., 2020).

On the other hand, the second narrative suggests improvements in farming activity, the use of regenerative agriculture and new technologies, such as: i) intensification (Cerri et al., 2018; Vieira Filho, 2018) and increased productivity at low cost (Saath & Fachinello, 2018; TNC, 2019); ii) the use of sustainability indicators (Agol et al., 2014), market mechanisms, such as Payments for Environmental Services (PES) (TFA, 2020), traceability and certification systems (Brancalion et al., 2017; Ingram et al., 2018; Ferguson, Sekula & Szabó, 2020) and investments in Private Natural Heritage Reserves (RNHR) (Negrões et al., 2011; Lima & Franco, 2013), and; iii) the implementation of integrated systems such as Crop-Livestock-Forestry (ICLF) (Balbino et al., 2012; Cerri et al., 2018) and the promotion of technical assistance to smallholder farmers (Brancalion et al., 2017; Stabile et al., 2020). Additionally, it highlights the need for land regularization to reduce land grabs and land

speculation (Carvalho et al., 2019; Stabile et al., 2020).

The evolution of production and deforestation dynamics over the past three decades has driven the development and implementation of protocols and agreements aimed at responding to the expansion of conversion of areas with native vegetation. The analysis of these experiences contributes to the formation of an analysis framework that seeks to identify the existing gaps in their implementation.

## THE INSTITUTIONAL ENVIRONMENT AND MARKET TRENDS

### National and international regulations

In the context where the agrifood chains focused on in this study are inserted, there are actions taken by social groups and governments to regulate transactions considering social and environmental issues.

At the national level, the **Forest Code** is the main regulation that affects the conservation of native vegetation in private properties. It establishes a minimum percentage of preserved area, called the legal reserve. The percentage varies according to the type of vegetation and location. It varies from 20% (for example, in the Cerrado) to 80% (for example, in the Legal Amazon). Besides, the Rural Environmental Registration (RER) requires the registration of all farm boundaries, which facilitates the monitoring of compliance with the Forest Code.

Compliance with the Forest Code is based on the RER and the State Environmental Compliance Programs (PRA), which can distinguish illegal from legal conversion, inspecting and sanctioning the conversion of new areas without prior authorization. Rural producers with environmental deficits on their properties can use these areas as long as they recover part of them and do not convert any other native vegetation to pasture or plantations. Note that the recovery of pastures and the implementation of areas of Crop-Livestock-Forest Integration are actions linked to low carbon agriculture.

However, authors such as Guedes Pinto et al. (2018) and Rajão et al. (2021) state that despite the importance of the Forest Code for the economy and for conservation, its regulation and implementation have serious delays. One of the biggest bottlenecks is related to the registration and validation of the RERs, since they are self-declaratory.

In the international sphere, the main discussions are about the **Legislative Proposals of the**

**European Union and the United Kingdom** to stop imported deforestation associated to agricultural commodities. Although the proposals are domestic in scope, they have the potential to generate cross-border impacts, influencing the policies of exporting countries and the practices of multinational dealers. On the one hand, there is an expectation that this legislation will help in the development of more restrictive policies, but on the other hand, it may lead to increased costs and/or trade boycotts.

Several discussions have occurred – both internationally and domestically – to understand to what extent these proposals will affect the Brazilian productive chains. Both legislations could generate positive results in Brazil, by managing to dissociate the commodities trade and deforestation. However, the scope and efficiency of the regulations are still uncertain, since neither the EU nor the UK is Brazil's main trading partner for most traded commodities. According to data from

SisComex (2022), in 2021, the share of Brazilian beef in the EU market was only 8.26%, while 44% went to China. In the case of soy, exports to the EU exceeded 15%, with the highest percentage, once again, being negotiated with China with almost 58%.

Another articulation that has occurred in the international scenario is a legislative project proposed by the United States, called **Forest Act 2021**, with the purpose of impeding the importation of products such as soy, cocoa, cattle, rubber, palm oil, wood and its derivatives from countries with high rates of deforestation. If the rural producer and/or the American importer cannot prove that the origin of these products, as well as their entire production chain, is from areas free of illegal deforestation, their import will be barred. Besides, the expansion of the alternative protein chain stands out as another component to be considered in this whole equation.

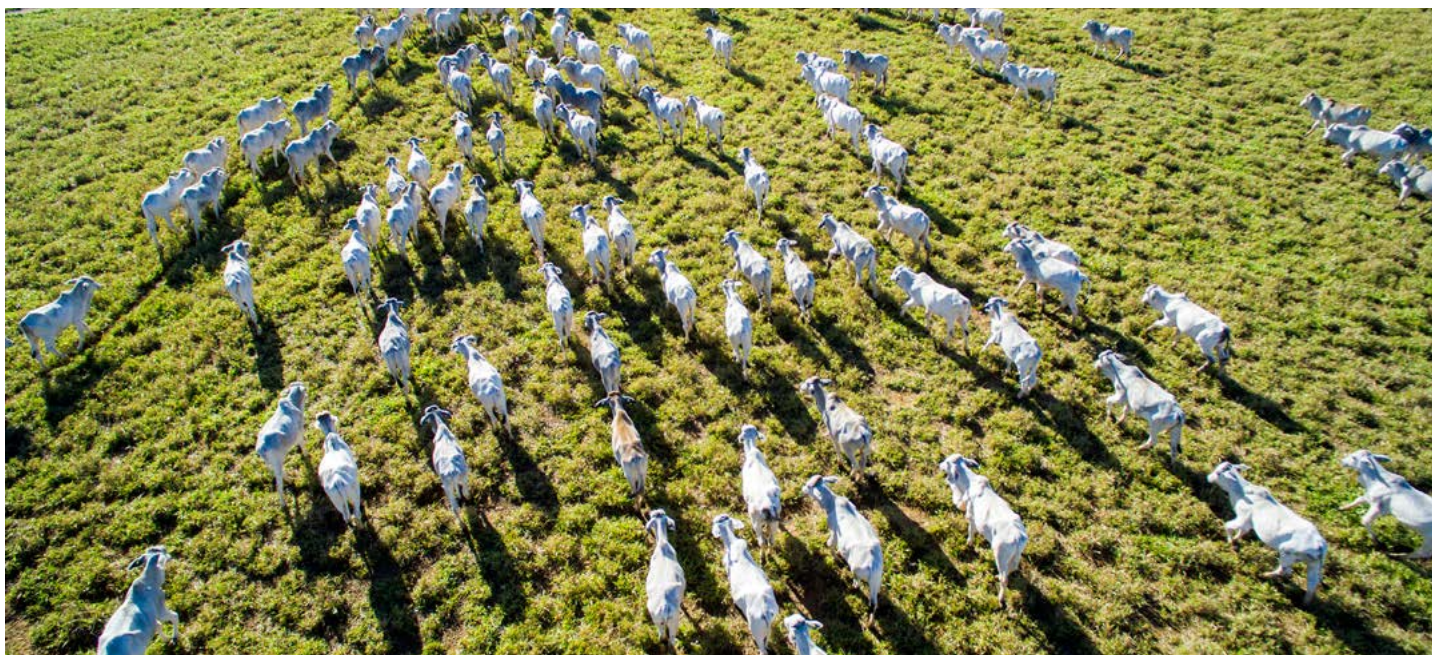
## MAIN CONSIDERATIONS

In general, each link of the agrifood chains analyzed in this study feels – to a greater or lesser degree – the pressure from other groups of stakeholders to address the deforestation issue. The final links represented by processors and distributors have greater visibility due to their more direct association with the consumer, especially those who have commercial relations with the European market, which is considered more demanding in terms of compliance with socio-environmental requirements.



**THE CONTINUITY AND IMPROVEMENT OF THESE INITIATIVES, OFTEN DEVELOPED AND IMPLEMENTED IN AN INDIVIDUALIZED WAY, NEED TO BE SHARED AND AGREED UPON BY THE WHOLE CHAIN.**





These two links, in turn, have constantly dialogued and articulated with rural producers, since they are considered to be the major vectors of the transformations aimed at combating deforestation. However, it is speculated that the high requirements coming from European importers and consumers can generate relevant impacts for the supply chains in Brazil, since the process of compliance with the standards is considered very costly. Other stakeholders in the value chains have also pointed out that with these new regulations, some productive sectors will have no choice but to seek less restrictive markets. And in this sense, China has shown itself to be one of the biggest players in these chains, especially soy and beef, as it still does not have import rules that restrict products associated with deforestation.

If on the one hand the European market has been exerting strong pressure for the implementation and enforcement of socio-

environmental criteria, in view of the proposed legislation for the importation of deforestation-free products in course - from the production process to the importation of products from Brazil - on the other hand, both the internal and the Asian markets, especially the Chinese and Middle Eastern markets, end up not having the same rigor. The biggest commercial beacon is the price, both in domestic and export trade. This explanation has still served as an argument for part of the productive sector in preferring to negotiate with these markets, due to the low demand for criteria such as combating deforestation, including illegal deforestation.

Communication and the language used in the different links of the chains are also among the factors that have contributed to good experiences not being multiplied more easily. The terms used - and the understanding of them - regarding the design of strategies to combat deforestation are not common

among the stakeholders. This reality has impacted the construction of a more homogeneous narrative within the chain. The result is an insufficient articulation of the various links of the chain. It is true that much has been done, by different stakeholders, in favor of the conservation of native vegetation. But the continuity and improvement of these initiatives, often developed and implemented in an individualized way, need to be shared and agreed upon by the whole chain.



# Part 3

## **Strategies and interactions of stakeholders in the chains:** the emblematic cases in soy, beef cattle ranching and regenerative agriculture as an alternative



**The choice of the cases analyzed in the following pages was made following some criteria. The first one concerns the adherence to the crops that were listed in this study. A second is the ability to bring together diverse stakeholders in the same initiative. In other words, experiences with a multistakeholder character were selected. A third and last criterion considered the innovative character of the experience, by changing the current dynamics for actions that were capable of reducing deforestation. The main information concerning the selected experiences is highlighted in three cases that also bring the perception of representatives of the links of the productive chains analyzed, heard in interviews conducted during the course of this study.**

### CASE 1 - GRAINS: CORN AND SOYBEANS IN MULTISTAKEHOLDER CONCERTATIONS

Over the last 17 years, the arrangements formed from multistakeholder concertations around the production of grains, especially soy and corn, have been expanded. Such experiences are consolidated in different ways, but seek a common objective: to curb the commercialization from deforested areas, especially in the Legal Amazon, but also in the Cerrado. Despite involving several stakeholders, the link in the chain where the Soy Moratorium, the Pará Green Protocol for Grains and the Soft Commodities Forum (SCF) have the greatest impact – according to the interviews carried out – is with the companies that produce and sell grains (chart 1).

For the representatives of the industries interviewed, this is the most pressured link to comply with the agreements established, especially the large processors. For them, the smaller and medium-sized companies are not charged as much, a fact that ends up generating an unfair competition.

Besides the industries, the producers were also mentioned as a link that suffers pressure, since it is from where the most deep changes are expected. Representatives of the Brazilian Association of Soy Producers (Aprosoja) highlighted, also in an interview, that many times this pressure is excessive as the processing industries and traders end up taking international commitments, with requirements beyond the environmental legislation in force (Forestry Code), which is already fulfilled by the rural producers. This has affected the relations between the two links and generated disagreements that range from withdrawing from multistakeholder concertation forums to the construction and implementation of unilateral mechanisms that guarantee the legitimacy of their actions, as is the case of the Soja Legal Project (an initiative created after the spin-off of Soja Plus). For the representative of Abiove (Brazilian Association of Vegetable Oil Industries), the Brazilian processing industry is very aware of market trends, and has shown important advances in combating deforestation, especially in the Amazon.

TABLE 1. MAIN EXPERIENCES IN THE GRAIN CHAIN.

Case	Creation	Scope	People in Charge	Stakeholders involved	Links upon which it has an impact
Soy Moratorium Amazon	2006/2008	Legal Amazon	Abiove, Anec, Government	Companies, Government CSOs, NGOs	Soy producers/ trade
Pará Green Protocol for Grains	2014	Pará	Public Prosecutor's Office, State Government, grain producers/trade	Companies, Public Prosecutor's Office	Soy producers/ trade
SCF	2018	61 municipalities in Matopiba and MT	SCF, Abiove	6 WBCSD member companies <sup>4</sup>	Soy producers/ trade

<sup>4</sup> World Business Council for Sustainable Development.



According to the interviewee (one of the key stakeholders in the articulation of the Soy Moratorium) the entire process, from conception to monitoring of multistakeholder concertation initiatives, has an educational nature, since it is based on dialogue, negotiations and convincing. It is exactly through this articulation that the success in reaching the objectives proposed by the moratorium has come, after existing for 17 years.

Despite the differences in the design and strategies of these experiences (Table 2), the literature points out that important advances have been made since the implementation of these agreements (Gibbs et al., 2015), but some obstacles still remain. The “heating” or “washing” of grains is considered by researchers and the various interviewees as a problem that has not yet been completely solved. Besides,

note also that actions to combat illegal deforestation, within the same property, should address other commodities, not only soybean. According to Abiove’s representative, we need to engage indirect suppliers, cooperatives and associations to avoid triangulation and also to promote the monitoring of transition areas. Aprosoja’s representatives emphasize that we need to consider the regional realities and differences and their particularities when approaching producers and promoting regularization. Besides, for soy producers, the State has a fundamental role in providing land security, considered as a starting element so that other actions can be implemented, especially to get access to credit and financing.

According to the interviews carried out, this ends up undermining the investment opportunities in potential

initiatives for a more sustainable and less damaging agriculture, which could be translated into more precise impacts on the reduction of deforestation and climate change. This thought about other investment possibilities is shared with the representatives of international NGOs, for whom there is a huge scope for regenerative agriculture and pasture restoration.

For processing companies, by giving in to market pressures, especially in Europe, there is an additional cost that can lead to a loss of market share, a conflict that is exacerbated by the absence of regulations of the same level in China, and thus runs the risk, as informed by a representative of the Public Prosecutor’s Office, of creating a specific chain for exports, without the problem of deforestation being effectively addressed. Besides this, the

TABLE 2. COMPARISON BY SOYBEAN AND CORN CHAIN

Experiences	Program Design		Program Strategies	
	Similarities	Differences	Similarities	Differences
<b>Soy Moratorium Amazon</b>	Voluntary adhesion agreements, signed to respond to market pressures, with a multistakeholder characteristic	Focus on soybeans produced in the Legal Amazon	Commitments to purchase products from areas free of deforestation and the identification of producers who do not meet pre-established requirements	Operations in the Legal Amazon. Zero deforestation
<b>Pará Green Protocol for Grains</b>		Focus on grains (soy and corn) produced in the state of Pará		Operations in Pará. Illegal deforestation. Compulsory regular RER, checks the overlap with UCs and TIs. Checks the productive capacity of the establishment. Suppression permit
<b>SCF</b>		Focus on soybeans produced in some municipalities of Matopiba and MT. Business initiative that relies on the participation of NGOs for capacity building		Pilot agreement in some Cerrado municipalities, focusing actions on dissemination of good practices



lack of coordination with other links in the chain and the lack of support from the public sector and banks were considered to be important obstacles to greater progress. Since the progress that these initiatives had in the Amazon was verified, there have been claims for their expansion to the Cerrado (Brown & Koepe, 2014; Imaflora, 2017; Valdiones et al., 2022). The SCF seeks to equalize this gap by initiating greater monitoring of soy production in this biome, but it is still too recent to have a concrete evaluation of the gains.

If, on one hand, a greater dialogue with the financial sector is demanded by processors, on the other hand, an interviewed representative of the Banco do Brasil states that all credit operations carried out are in line with specific Central Bank rules, improved after the Soy Moratorium. They are also in all links of the chains in the financing of several crops,

including small producers, and may act in another bottleneck pointed out by almost all interviewees: language. The absence of unity regarding the concepts – and even the rules – that involve deforestation issues hinders the dissemination of good practices.

The input companies also have great potential, given their capillarity in promoting dialogue between the links, especially when working with indirect producers. These companies have disseminated the possibilities of adopting other forms of production with higher added value, but especially with reduced production costs – such as the use of bio-fertilizers and biological pesticides, which have proven effective in preventing pests and generating less economic loss for rural producers – and that are not based on deforestation, through incentives, investments, and technical assistance.



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This articulating potential was also remembered by the soy producers' representatives. However, they warn about the different interests that may overlap with the broader sustainability theme, making sectorial articulation dedicated to the implementation of good practices unfeasible, thus fragmenting the sector even more.

## CASE 2 – BEEF CATTLE RAISING: EXPERIENCE IN MULTISTAKEHOLDER CONCERTATION SPACES

As in the case of grains, more than 13 years ago the beef chain saw the emergence of spaces to negotiate the bases of agreements to eliminate deforestation, as well as other illegalities such as the invasion of indigenous lands, and slave labor (box 3). In the context of the emergence of the agreements in force today, such as the Conduct Adjustment Agreements (TACs) for Meat and the so-called Meat Public Commitment, civil society organizations and public agents were the protagonists. The processing industry, represented by the meatpacking companies, was the link most held responsible, according to the interviews carried out, responsible for moving the supply chain in compliance with the requirements on combating deforestation, specifically in the Legal Amazon (chart 4). In this trajectory, the large retail chains

were also involved, and more recently the financial sector.

The literature states that these commitments were effective in the years that followed, as the number of properties that registered their RERs increased, and the number of properties with environmental proceedings related to deforestation decreased (Barreto & Gibbs, 2015). This is due to pressure on the large meatpacking companies that are signatories to the TAC and the Commitment, which also began to monitor their direct cattle suppliers. Since 2020, this practice has been operationalized harmoniously by the three largest meatpacking companies in the country, and by other meat processors, especially in the Amazon. This movement has gained more signatories as companies decide to pursue good practices in their chains, to give more transparency to their actions, or to adapt to the requirements of their clients, especially the European ones. However, note that, especially

the processing industries, still have great difficulties in accessing information from their indirect suppliers, which impacts the chain's transparency and traceability.

A similar situation has occurred with retail chains since they have also been required to monitor their meat suppliers. Once again, civil society together with the Public Prosecutor's Office in the states of the Legal Amazon has pressured the retail chains to elaborate their purchasing policies more restrictively regarding deforestation and other social impacts. However, in an interview with representatives of this link, the disproportionality between the largest retailers operating in Brazil and the regional retail chains was mentioned. According to them, for the meat value chain to effectively fight deforestation, the regional retailers must also be pressured and committed to implement policies of this type in their purchases.

TABLE 3. MAIN EXPERIENCES IN THE BEEF CHAIN

Case	Creation	Scope	People in Charge	Stakeholders involved	Links upon which it has an impact
Public Commitment of Livestock	2009	Legal Amazon	Greenpeace, JBS Marfrig, Minerva	Cold storage/meat processors	Producers/meat processors
Legal Meat TAC	2009	Legal Amazon	Public Prosecutor's Office, Legal Amazon states, Imaflora	Meatpacking Companies/ Meat Processors, Public Prosecutor's Office	Producers/meat processors
Retailer Commitment	2013	Legal Amazon	Abras <sup>5</sup> , Carrefour, GPA, Grupo Big, NGOs	Public Prosecutor's Office, Meatpacking Companies/ processors, Retailers (GPA, Carrefour, Walmart - Big)	Meat processors, Retail

<sup>5</sup> Associação Brasileira de Supermercados.



TABLE 4. COMPARISON BETWEEN THE DIFFERENT COMMITMENTS OF THE MEAT CHAIN

Experiences	Program Design		Initiative Strategies	
	Similarities	Differences	Similarities	Differences
<b>Public Commitment of Livestock</b>	Multistakeholder initiatives with coverage only in the Legal Amazon	Focuses on the beef chain, starting with the processors. Covers only the 3 largest Brazilian meatpacking companies	Demand that monitoring tools for the beef chain be implemented; interface with producers.	Focus is on eliminating legal and illegal deforestation in the supply chain
<b>Meat Adjustment Agreement</b>		Agreement demanded by the Public Prosecutor's Office. Focus on the beef chain, starting with the processors. It covers all meatpacking plants in the states of the Legal Amazon that want to be signatories.		Focus is on the elimination of legal deforestation in the supply chain of the direct ones. The indirect ones with a gradual rule.
<b>Retailer Commitment</b>		Focus on the beef chain starting with the retail chains	Monitoring of the beef chain	Strategy of not marketing products originating from deforested areas in the Legal Amazon. Awareness raising and interface with the final consumer

In any case, we need to emphasize that the efforts implemented by the three largest processing companies in Brazil, together with public power and civil society stakeholders, have reflected in the improvement of previously established agreements. When interviewed, these companies showed enormous interest, and important advances, in ensuring the monitoring of their direct suppliers, and part of the indirect ones (which are still a challenge to guarantee a completely deforestation-free chain). Despite facing problems regarding the traceability of their chains, these companies have sought solutions with the rural producers, as they know that in this link is where lies the biggest challenges in combating deforestation. This articulation has been fundamental to: i) identify potential risks and mitigate them; ii) assist in the environmental regularization of these suppliers; iii) inform/instruct producers to adopt good practices; iv) assist producers

in obtaining agricultural credits/financing from banks.

When asked in the interview about the links that can broaden the scope of the agreements already established, and even improve them, the input sector and banks/financiers were mentioned, as they are the links that deal directly with cattle producers. Whether through the supply of agricultural

inputs or access to credit and financing, these are links that need to be involved in strategies to combat deforestation from now on. By integrating these stakeholders, not only in the sectorial agreements, but also in the negotiations around the theme, the chances of achieving more effective results increase significantly.



### CASE 3 - REGENERATIVE COFFEE: THE RESIGNIFICATION OF GOOD AGRICULTURAL PRACTICES

Regenerative agriculture is commonly adopted by producers, but there is no time frame that identifies the beginning of its practice in these terms in Brazil, although its practice can be considered secular. In some commodities there is the adoption of sustainable practices linked to this type of management, such as: (i) rotation or successive cultivation of more than one crop in the same area; ii) cover crop/ planting all year round, so that the soil does not lie fallow during the off-seasons, which helps prevent erosion; iii) conservative cultivation, or less plowing of fields; iv) cattle grazing, which naturally stimulates plant growth; v) decreased use of fertilizers and pesticides; vi) no, or limited use of Genetically Modified Organisms (GMOs) to promote biodiversity<sup>4</sup>; vii) promotion of animal welfare and fair labor practices for producers. In Brazil, these practices have already been employed in the production of coffee, popcorn, cotton, and soybeans, and can be expanded to any other crop.

Interest in regenerative agriculture has been growing over the past few years, with the promise of articulating the growing demand for food production and the global pressures for sustainability. Despite garnering interest from a variety of stakeholders, Newton et al. (2020) state that there is still no widely accepted definition. Definitions

are based on processes, outcomes, and a combination of the two. Each has specific implications that can influence policies and programs. The authors warn that the absence of a common definition brings some challenges, including the loss of credibility and the difficulty in establishing mechanisms to boost this type of production, whether by the public or business sector. In Brazil, there is a set of good practices such as the Crop-Livestock-Forest Integration (ILPF), No-Tillage Systems, among others. These actions are part of the ABC Plan strategy (Sectoral Plan for Mitigation and Adaptation to Climate Change for the Consolidation of a Low Carbon Emission Economy in Agriculture), created by the federal government in 2010, as a way to promote the adoption of more sustainable production technologies in the country.

From the commercial point of view there are some initiatives ongoing mainly among coffee producers that have generated a specific certification for products from regenerative agriculture. There is also a discussion about the adoption of a specific protocol, headed by Embrapa, but still without definition. Nestlé, which already operates with 100% of certified coffee producers, has been implementing projects aimed at regenerative agriculture. Despite being recent, the company representative informed in an interview that the results will be seen in the next harvest and the success with producers can be measured by productivity,

reduction of production costs, and landscape restoration.

In this scenario, what we can see is that this is a recent initiative that still does not have a robust institutional framework. However, it has been gaining the adhesion of producers who are interested in sustainable practices, including large-scale grain production, stimulated by the demands of the market and consumers who are concerned about the issue. But note that it is not this factor that convinces the producer to adopt more sustainable production practices, but the financial gains that the producer may obtain, according to interviews conducted with companies and producers. Just as it happened years ago in the organic agriculture boom, the valorization of the product by means of a certification is the strategy most sought after by coffee producers and the processing industry.

Regenerative agriculture – by giving new meaning to good agricultural practices – seems to be a good bet to introduce sustainable practices that can increase productivity in an environmentally responsible way, while making it possible to decrease production costs. Thus, it may represent an alternative response to both market pressures and sustainable food production, also acting as a climate change mitigation strategy.

<sup>4</sup> Regenerative Agriculture does not rule out biotechnology. The non-use, or the use, of specific technologies does not necessarily make it regenerative.

## CASE 4 – CORPORATE INITIATIVES TO COMBAT DEFORESTATION

In interviews with the companies that represent the links in the production chains analyzed,

their own initiatives were highlighted, which not only aim to combat deforestation but also point to possible paths to more sustainable agricultural practices, especially addressing

the issues associated with climate change. The main corporate programs, mentioned by them, and organized according to the value chain, are summarized in chart 5.

TABLE 5. SYNTHESIS CHART WITH THE MAIN CORPORATE INITIATIVES

Chain/Link	Company	Program	Objective
Grains	Amaggi	Platform <i>Original</i>	Generate reliable information and greater traceability, to assist purchasing decisions and improve the relationship with rural producers, through geospatial analysis, rural registers and exclusion lists
	Cargill	Land Innovation Fund	To seek solutions to combat deforestation, supporting initiatives that promote a sustainable soy chain, generating positive socioeconomic and environmental impacts in the Cerrado, Amazon and Gran Chaco
	FS	Strategic actions	To develop strategic actions in the corn chain, focusing on zero deforestation, respect for labor rights and the traceability of the chain of direct and indirect suppliers
	Grupo Sabará	Strategic actions	Develop strategic actions to implement regenerative agriculture in grain production, and promote the strengthening of sociobiodiversity product chains in the Amazon
Cattle Ranching	JBS	Green Offices	Offer free support to suppliers that operate in the Amazon, in the compliance with socio-environmental requirements, and environmental regularization of their properties, until 2025
	Marfrig	Green +	To identify and understand how suppliers need support to be able to comply with the company's socio-environmental criteria, to ensure a deforestation-free chain by 2030
	Minerva	Renove	To engage the collaborative performance of the company's suppliers and non-suppliers, through good practices with low carbon emission and conservation, increasing productivity and income in the field
Coffee	Nestlé	Regenerative Agriculture	Encourage regenerative agriculture throughout the supply chain, so that by 2030, 50% of its ingredients come from this practice, and from certified farms
Inputs	Bayer	Pro Carbon	Implement best practices for carbon accumulation through direct consulting and financial mechanisms for more than 1800 farmers in Brazil with the aim of becoming carbon neutral by 2030
	Nutrien	Strategic actions	Develop strategic actions aimed at modern agriculture linked to the preservation of biodiversity, through products, services and technologies that increase productivity with lower use of inputs
	Yara	Strategic actions	Develop and implement practices to reduce carbon emissions by half, and offer the traceability of its products
Financial Institutions	Banco do Brasil	Strategic actions	Contribute with credit lines and technical assistance to the different links in the agricultural chains, provided that there is proof of environmental regularity and respect for socio-environmental issues



Therefore, we can see that there are several initiatives that include from the improvement of traceability to the implementation of ongoing good practices by the companies. Some of them even have similarities and interfaces with other actions and even other links in the chain. This shows that there is a corporate concern so that the products marketed and processed by them come from areas that respect the socio-environmental criteria, as provided for in the sectorial agreements and international pressure.

## MAIN CONSIDERATIONS

Even in the face of difficulties and oscillations, it is undeniable that the commitments in the grain and beef chains have acted to reduce the conversion of native vegetation, more specifically in the Amazon. The projections of an ideal scenario may not have been achieved, nor deforestation zeroed. But what the analyzed experiences demonstrate, besides a significant, albeit temporary, reduction in environmental damage, is that the insufficient integration between the links of the evaluated agrifood chains, as well as between public and private stakeholders, was not able to contribute to the expansion, or the spill-over, of the positive effects of the sectorial agreements.

A scenario that intends to make strong advances, which is necessary and urgent from now on, assumes not only the articulation of the State with the private sector, but also the union of efforts within these sectors. I.e., the actions must overcome the

private barrier of each company and be expanded to sectorial actions that articulate different links and different chains; just as the state actions must be well coordinated among the federative levels. For this, some measure of governance must be adopted, since we are dealing with different interests that need to be equalized so as not to incur in the dissolution of existing alliances, as it happened more recently with the Soja Plus Program, broken into two initiatives, as a result of the strained relations between the representatives of producers (who created the Soja Legal Project) and the processing industries (who gave another name to the initiative, now Agro Plus Brazil).

The fact is that the lack of action by government entities, especially at the federal level, combined with the current fragile situation of the command and control mechanisms and the low environmental governance, have made it difficult for the stakeholders of the analyzed chains to engage. Likewise, the lack of clarity and direction among the links have also affected the integration with other stakeholders in these chains. This aspect was often mentioned in the interviews with representatives of the cattle and soy chains, but also of civil society organizations, Public Prosecutor's Office, and financial institutions, from two perspectives. The first is associated with the **communication between the various stakeholders and links in the sector**. The absence of unity with regard to concepts and definitions, and even the regulations in place that involve deforestation

issues, are aspects that impact communication and tend to fragment the actions of the links in these chains. According to the rural producers interviewed, there is a disharmony within the category itself. There is no common understanding about the limits of deforestation, nor about the rules set by the Forest Code, and even less about the benefits of adopting more sustainable practices, such as the use of agricultural inputs of biological origin or the implementation of ILPF systems, which would significantly reduce production costs. Although technology and innovation are present in the market, aiming mainly at productivity growth, today, the rural producer sees no alternatives that would increase his profitability, but to expand his production to new areas.

In the interviews with the processing industries and retailers, the same problem of common understanding between stakeholders was also pointed out. According to the representatives of the companies, the understanding and the language used by the different links in the cattle and soy chain, is not common among these stakeholders, which is why it has been difficult to combat the causes of deforestation. In this sense, and associated with the second bias, the three links (producers, processors, and retailers) shared that without the **co-responsibility of all stakeholders involved, of society, but especially of the State** in addressing the issue, the chances of eliminating deforestation from the production process are increasingly distant.

Another point brought up by the processing companies is related to the existing misalignment among them in the demands made to their suppliers. This has legitimized non-engaged producers to refuse to adapt to the strictest standards, and to seek other buyers who are less judicious, or less concerned with the socio-environmental issue. This shows that if only a few links are aware and engaged, actions will have insuperable bottlenecks that will undermine the efforts of the entire agrifood chain. At this point, the commitments also had an important effectiveness by establishing a common metric to be followed. However, one of the limitations to be highlighted is the fact that they put pressure on links and chains isolatedly: in the Soy Moratorium, only the soybean chain and the link of direct suppliers and buying companies; in the Green Protocol for Grains the situation is repeated, with the addition of corn as a crop to be observed; in the SCF, only the soybean chain and direct suppliers and buying companies; in the Livestock Public Commitment and the Legal Meat TAC, only the beef chain and the link of direct producers and processors; and in the Retail Commitment only the beef chain and the link of processors and retailers.

Gibbs et al. (2015), Gollnow et al. (2018) and Virah-Sawmy (2019) point out that beyond grains, actions aimed at zero deforestation should go beyond a single product. The authors quote, e.g., the need to extend monitoring to meat production. There is a dynamic of complexity and interdependence involving sectors (soy and cattle) and



## **THE THREE LINKS (PRODUCERS, PROCESSORS, AND RETAILERS) SHARED THAT WITHOUT THE CO-RESPONSIBILITY OF ALL STAKEHOLDERS INVOLVED, OF SOCIETY, BUT ESPECIALLY OF THE STATE IN ADDRESSING THE ISSUE, THE CHANCES OF ELIMINATING DEFORESTATION FROM THE PRODUCTION PROCESS ARE INCREASINGLY DISTANT.**

regions (Cerrado and Amazon) (Sawyer, 2009; Silva & Oliveira, 2018; Carvalho et al., 2019; Lima et al., 2019; Marques et al., 2019; Waroux et al., 2019; Stabile et al., 2020). With the expansion of cultivation, other agricultural activities – such as cattle ranching – would be shifted to the Amazon generating so-called indirect effects on the environment and local groups. Besides being ambiguous, the territorial impact of large plantations tends to be quite heterogeneous (Favareto et al., 2022).

In this way, different chains and links would be connected in actions towards the same objective, which, besides potentiating the efforts made, can have impacts on the optimization of costs of the monitoring process, which is complex and quite costly. The joint and co-responsible articulation is also one of the ways to equalize the pressures on the different links and chains, as well as to mitigate situations in which there is unfair competition from stakeholders less engaged in the common causes. Once the players work together, the pressures will be exerted by all the links and will not appear as isolated

and detached demands – a situation that opens room for opportunists. However, although the respondents recognize the limitations and weaknesses of the chain as a whole, the doubt still remained about who would be, or would be the institutions that would captain the task of being the speaker/articulator between links/sectors/stakeholders.

Finally, regenerative agriculture seems to be the important bet to introduce sustainable practices that can, at the same time, increase productivity while being environmentally responsible, reduce production costs, diversify crops, promote landscape restoration, reduce carbon emissions, and also stimulate the adoption of good social practices. Still incipient in the production of commodities, the extent of its broad possibilities cannot be analyzed. If some pilot projects are being put into practice, we need to know whether there will be the institutional capacity, the articulation among the various links in the chains, and the coordination to bring together the various interests and the public and private players to multiply these experiences.

# Conclusions

**From the analyses presented, some conclusions emerge that can contribute to improve the ongoing actions or, still, to inspire other solutions for combating deforestation. The complexity of the theme – which involves national and international players and diverse interests – will not have a single solution as an answer. However, the approach to the environmental issue needs to be unified and greater interaction depends on this, both in the various links of the chain and between the chains where products overlap, as in the case of soy and cattle farming.**

The same reading applies to the private sector and the public bodies in their three levels, always in line with civil society, focused not only on socio-environmental issues, but also in the field of transparency and democracy.

The data from the last three decades translate into numbers the behavior of the various entities involved in combating deforestation. Something between speech and practice does not match and reveals

the increase in the conversion of native vegetation today, especially in the Amazon and Cerrado. You cannot blame only the Non-FF for the expansion of production over regions with original vegetation cover, nor the FF, given the present agricultural dynamics, whose behavior in recent decades has been of expansion. Despite the effort to promote agreements and initiatives that have proven to have some effect in response to market and civil society pressures, and that have been fundamental in regulating less demanding markets, there is still a long way to go, in which steps must be taken quickly and coordinately.

Through this study important conclusions were identified. The first, which needs to be highlighted, concerns the difficulty in establishing any type of convergence between the stakeholders if there is ambiguity - or even a position favorable to deforestation - on the part of governmental institutions that are ultimately responsible for territorial planning and the application of command and control mechanisms.

A second important finding is that to promote a change of behavior throughout the



**THERE IS A COMBINATION OF INSTITUTIONAL ARRANGEMENTS, THAT MAKE FEASIBLE THE SCALABILITY OF INITIATIVES THAT HAVE ALREADY BEEN IMPLEMENTED IN THE SOYBEAN AND BEEF CATTLE RAISING CHAINS FOR OTHER CROPS.**



agrifood chain, we need to understand that the links and stakeholders involved in the value chains should work in the same direction. It is crucial to seek cooperation and co-responsibility among these stakeholders. This does not mean that power asymmetries between them are not considered here, but that we need to share the solutions presented, in an attempt to reverse the value given to socio-environmental issues. From the supplier of agricultural inputs to the consumer, each link and stakeholder can, needs, and must play a role in facing not only the opening of new areas of native vegetation, but also climate change.

Finally, a third conclusion concerns the need to undertake new approaches to give new meaning to the value currently given to the issue of deforestation. As was shown previously in the spatial analyses, high productivity and the adoption of sophisticated technologies are not decisive factors for reducing deforestation. In fact, what we notice is that as long as there are available areas and income, or gains from agricultural activity, the production will expand to new areas, and this is independent if the cultivation comes from family agriculture or not. Therefore, it is important that there is a combination of institutional arrangements, among the different links, capable of

ensuring the monitoring and traceability of these agrifood chains, promoting environmental conservation, seeking ways to encourage farmers to maintain their areas of native vegetation, offering production practices that ensure productivity and reduce production costs, and mainly, that make feasible the scalability of initiatives that have already been implemented in the soybean and beef cattle raising chains for other crops.



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