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Reshaping Brazil's Degraded Pastures: Unlocking Sustainable Growth

Joshua Doyle
Harvard Kennedy School

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RESHAPING BRAZIL'S DEGRADED PASTURES: UNLOCKING SUSTAINABLE GROWTH

By Joshua Doyle

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Client: The Climate Policy Initiative

Faculty Advisor: Adjunct Lecturer of Public Policy, David Wood

Seminar Leader: M-RCBG Lecturer of Public Policy, John Haigh

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Executive Summary

As the largest net exporter of agricultural products, Brazil's role in promoting sustainable food production is essential for both itself and the world.[i] With rising food demand from developing countries like China, Brazilian policymakers must find ways to meet the increasing demand for agricultural commodities like beef, soy, and corn while limiting new deforestation to the greatest extent possible.[ii] With approximately 60% or 107.6 million hectares of Brazilian pastures showing low to medium levels of degradation, these lands represent a significant opportunity for food producers to increase sustainable food production that limits additional deforestation.[iii] Through effective institutional support and investment, degraded pastures can be transformed into various productive agricultural systems, including intensified cattle and dairy farming, crop conversion, agroforestry, and restored native ecosystems. In this context, this study aims to answer the following three questions.

1. What policy changes are required to effectively scale the conversion and restoration of degraded pastures? These changes focus on both positive and negative incentives to reach this goal.
2. How does the PNCPD fit into existing policy mechanisms, and what can be done to make it more successful?
3. What is the role of international policy mechanisms like the European Union's Deforestation Regulation in converting and restoring degraded pastures?

Chapter 1 provides an overview of the Brazilian agriculture sector, in which degraded pastures are one lever for contributing to the country's recent growth and

economic importance. To manage these lands more productively, an ecosystem of policies establishes clear regulatory frameworks and guidelines for producers. Instruments like the Forest Code, the NDC, the Plano Safra, and international regulations such as the EUDR shape both the incentive structure and compliance requirements for the agricultural sector, forming a foundation for novel policy approaches. Despite the large number of degraded pastures, only 27.7 Mha are managed by producers eligible for subsidized public credit, of which 73% are smallholder farmers.[iv] The PNCPD, which aims to attract $120 billion of private and international capital to convert these areas into productive systems, is the latest government proposal to accomplish this goal.[v]

Chapter 2 focuses on the tension between economic growth and environmental protection, in which national and international stakeholders interested in Brazilian food production offer conflicting visions of the sector's future. These narratives lead to four key challenges for pastoral conversion and restoration:

1. Inadequacy of existing policy mechanisms;
2. Imbalance of financial incentives for producers;
3. Competing priorities for degraded pasture conversion and restoration; and
4. Limited government coordination;

Chapter 3 makes five recommendations that rely on a combination of institutional changes and risk-reducing mechanisms to support producers in their quest to transform degraded pastures.

1. **Enforcement of punitive measures:** IBAMA's increasing capacity for successful environmental monitoring needs to be supported by a judicial system that can collect fines and hold illegally operating producers responsible. Improving this capacity through adequate staffing is crucial to closing the enforcement gap for illegal infractions. This approach needs to be complemented by an EUDR definition that considers illegal deforestation across Brazil.
2. **Collaboration for bringing farmers into compliance**: MMA, MAPA, IBAMA, and the Federal Police should collaborate on a public program that uses degraded pastures as a pathway to bring illegally operating producers back into compliance. Environmental oversight and tiered subsidized interest are methods for incentivizing this change.
3. **Dedicated TA facility**: Allocate a share of loan application fees to technical assistance facilities instead of financial institutions. Given SENAR's experience providing technical assistance, the organization is ideally placed to provide these services to producers.
4. **Guarantee facility for degraded pastures**: Incentivize credit access across different agricultural systems, taking the tenor and riskiness of the cashflows into account through guarantees.
5. **Variable interest rates**: The same approach is proposed through variable interest rates. This differentiation would allow rates to better align with the cost structures and expected cash flow timelines of different systems, whether agroforestry, integrated livestock forests, or crop conversions.

Introduction

The world's population is expected to reach 9.7 billion in 2050, an increase of nearly 2 billion persons in the next 30 years.[vi] This population growth requires sustainable ways to increase agricultural production that meets the dietary needs of such a vast amount of people. The pressure on food systems will intensify as more land is needed for agriculture, leading to harmful environmental impacts like deforestation.

Currently, land use change or deforestation emissions represent between 12% and 20% of global GHG emissions, an estimate that is expected to increase over time.[vii] This pressure is particularly intense in Brazil, a country that is a leading producer and exporter of commodities like soybean, sugar, coffee, and livestock. However, Brazil also has over 100 million hectares of degraded pastures, which can be repurposed for agricultural and livestock expansion, offering a way to grow production without further deforestation.[viii] Several domestic agricultural policies aim to promote the conversion and restoration of these lands to incentivize farmers toward environmental conservation. Leveraging these strategies will be crucial in meeting global food demand while mitigating the climate impact of agricultural expansion.

Problem Statement and Research Questions

In December 2023, Brazil's Ministry of Agriculture and Livestock (MAPA) proposed converting 40 million hectares of degraded pastureland into productive food systems, biofuels, and high-productivity forests over the next 10 years.[ix] The National Program for the Conversion of Degraded Pastures into Sustainable Agricultural and Livestock and Forestry Production Systems (PNCPD) aims to mobilize around $120 billion of international capital to promote financial incentives for farmers to convert degraded areas. At the same time, the Brazilian government has historically relied on agricultural policies to promote sustainable land use. One key initiative is the ABC/ABC+ Program, a low-interest credit line supporting sustainable farming practices.[x] Additionally, the Forest Code mandates legal reserves and permanent preservation areas, which are crucial in governing land use and curbing deforestation.

In this context, this study aims to answer the following three questions.

1. What policy changes are required to effectively scale the conversion and restoration of degraded pastures? These changes focus on both positive and negative incentives to reach this goal.
2. How does the PNCPD fit into existing policy mechanisms, and what can be done to make it more successful?
3. What is the role of international policy mechanisms like the European Union's Deforestation Regulation in converting and restoring degraded pastures?

The **Climate Policy Initiative**, a leading incubator and research institute for sustainable development practices in Brazil, collaborated with the author on this research.

Methodology

This report is segmented into a two-part methodology. First, the author conducted an extensive **literature review**, which included:

- Detailed review of government documents describing agricultural policies and laws in Brazil. Sources included MAPA, the Ministry of the Environment, and the Federal Constitution of Brazil.

- Academic research describing the technical challenges associated with the monitoring of deforestation and the effectiveness of the policy landscape.
- Commentary from think tanks and corporations on the investment opportunity for converting and restoring degraded pastures.

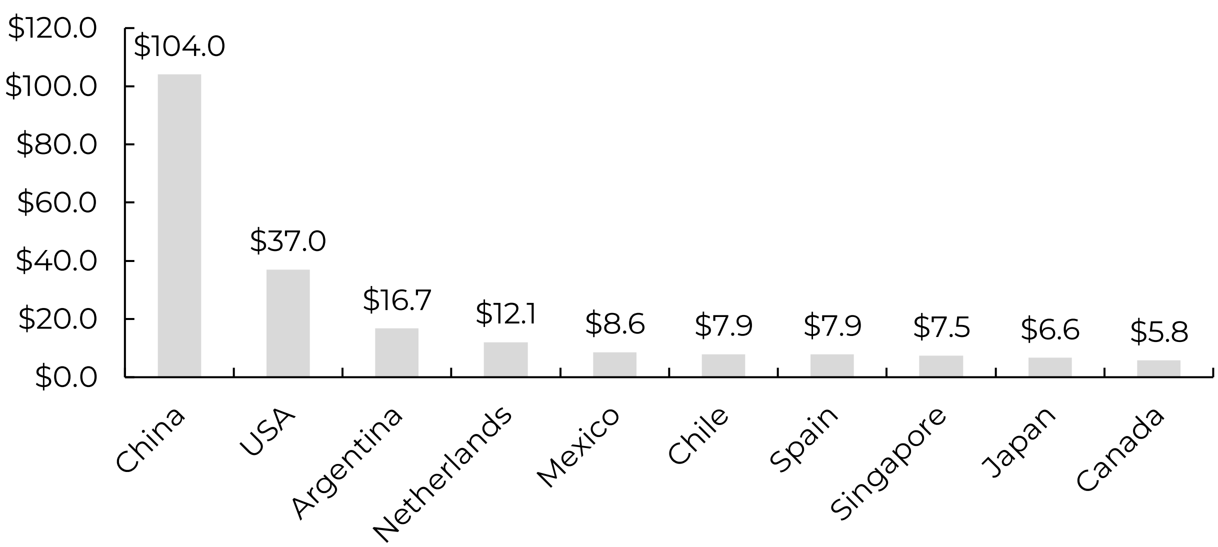
The literature review was conducted in English; Portuguese sources were translated using the DeepL Pro translation software.

Second, the author interviewed nine organizations, including financial, legal, government, and research community representatives. Interviewees were selected based on the agricultural production supply chain to reflect the perspectives of financiers, food producers, legal representatives, and off-takers. Some of the interviews took place via Zoom, while others took place during a 9-day research trip to Rio de Janeiro and São Paulo in January 2025. Interviews were used to formulate policy recommendations for the PNCPD and the broader policy-making enabling environment. The complete list of organizations interviewed is in Appendix A, but no individuals are named.

Chapter 1: The Brazilian Agriculture Sector

Brazil has the most considerable amount of arable land in the world while being the largest net exporter of agricultural products. In 2021, crop and livestock production accounted for 8 percent of Brazil's Gross Domestic Product (GDP) and employed about 15% of the country's labor force (about 15.1 million people).[xi] The sector has grown significantly as Brazil shifted its agricultural strategy from tropical products such as coffee, sugar, citrus, and cacao to becoming a key supplier of in-demand commodities such as soybeans, grains, poultry, and ethanol. Over the last two decades, the agricultural sector's value has increased by 8% annually, doubling output and tripling livestock production. Soybeans, in particular, stand out as Brazil supplies more than 50% of the world's soybean trade using 17% of the country's arable lands.[xii] As shown in Figure 1, foreign markets like China are major off-takers for Brazilian production, as they consume significant amounts of soybean, sugar, and corn.[xiii]

Figure 1. 2023 Brazil's Major Commodity Exports by Country (USD in billions)



Source: Trend Economy

Agricultural activity in Brazil spans 282.5 million hectares (Mha), accounting for a third of the country's national territory. [xiv] Approximately 63% or 179 Mha of this area is pastureland, which has been a major driver of deforestation over the last several decades. Among the country's six biomes, the Amazon has the largest area of pastureland, while the Cerrado accounts for the country's largest agricultural region. Producers across these areas are diverse, with over five million rural properties spanning a range of social, economic, and cultural backgrounds. While family farms make up 77% of all rural properties, a large share of agricultural production is managed by few producers, as 4% of farms operate 63% of agricultural land.[xv] Given the heterogeneity of these producers, climate risks affect the group in different ways. Climate impacts depend on farmers' size and income levels and vary considerably by crop and geography. For example, Brazil's Northeast includes some of the country's poorest regions disproportionately exposed to climate change.

Due to the country's targeted agricultural expansion, emissions associated with the sector represent 25% of Brazil's total emissions.[xvi] Therefore, the industry significantly contributes to the climate crisis but is also negatively affected by it through increasing drought and precipitation events. To mitigate further environmental impacts, policymakers have turned toward incentivizing the restoration and conversion of degraded pastures to limit future deforestation.

Chapter 1.1: The Opportunity of Degraded Pasturelands

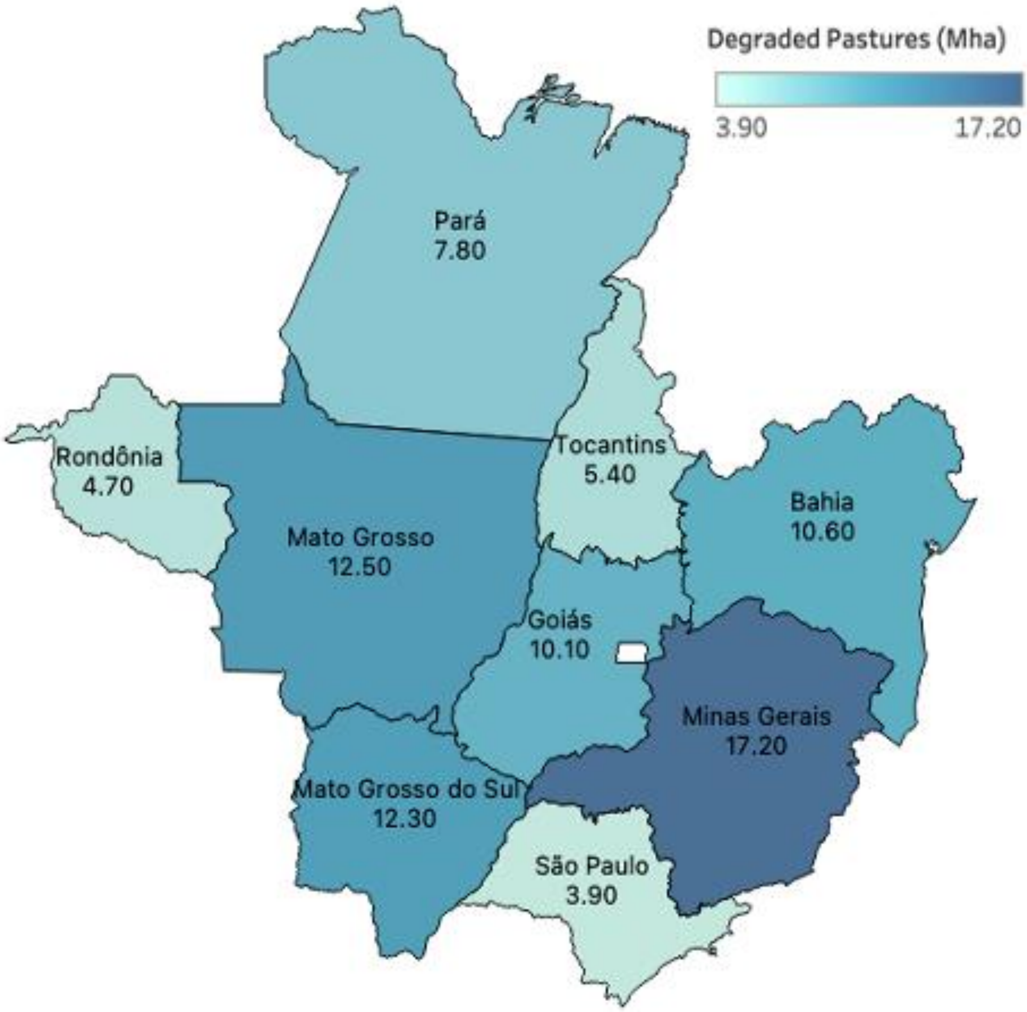
Degraded pastures are grazing lands that have experienced a decline in productivity, soil quality, and vegetation due to overgrazing, soil erosion, and inadequate management practices. This degradation has financial and environmental consequences, as the land's ability to support livestock and store carbon is diminished. In turn, farmers are pressured to clear new areas for grazing, contributing to increasing deforestation levels. Despite this, degraded lands offer a significant opportunity to improve agricultural productivity and generate future cash flows. Specifically, degraded pastures can be recovered for intensified cattle and dairy farming, converted to cropland, or restored to their native state (e.g., forests).[xvii] In addition, systems like agroforestry and integrated livestock combine agricultural and forestry elements, allowing for food production and native ecosystems. The time it takes to implement these new systems depends on their complexity and the severity of the degradation. For example, systems restored to their native state take much longer to implement relative to cultivating commodity crops like soy, corn, and cocoa. To have a complete sense of the possible uses for degraded pastures, see the list below:

- Intensification of cattle and dairy farming
- Agricultural plantations such as soy, corn, cocoa, and sugarcane.
- Integrated livestock systems
- Standing Forest Systems (e.g., Eucalyptus)
- Agroforestry systems
- Full restoration

Of Brazil's 179 million hectares of pastures, **approximately 60%** (107.6 million hectares) show low to medium levels of degradation, implying a significant opportunity for food producers and policymakers to increase sustainable production that limits additional deforestation.

As illustrated in Figure 2, nine states account for 79% of the total degraded pastureland (84.5 million hectares), with Minas Gerais, Mato Grosso, and Mato Grosso do Sul having the largest affected areas.[xviii]

Figure 2. Degraded Areas by Region



Source: MAPA

Despite the significance of the degraded area, 66.9 Mha belong to farmers who do not comply with the Rural Environmental Registry (CAR) or include restricted areas (e.g., military zones).[xix] In addition, certain regions do not have the biophysical attributes or the infrastructure to allow for the conversion and restoration of degraded lands. Thus, the current area policymakers consider eligible for public programs is 27.7 Mha, distributed across 1.02 million properties. However, this does not include 40.7 Mha or 1.8 million properties that have been deforested since 2008, who might be interested in such interventions.

Potential applications for the 27.7 Mha conversion include the intensification of beef and cattle farming (25.1 Mha) and dairy farming (16.9 Mha), as well as the conversion to forestry (11 Mha), agriculture (8.8 Mha), agroforestry systems (7.1 Mha) and integrated systems (2.6 Mha). It is also worth noting that while the 27.7 Mha is evenly distributed across farms of various sizes, 73% of the 1.02 million properties belong to smallholder farmers.[xx] Therefore, facilitating engagement with smallholders to overcome financial and logistical challenges is crucial to the success of any conversion and restoration efforts.

Table 1. Potential area by property size vs. percent of properties by size

Farm size	Area by property size	Percentage of properties by size classification
1-50 ha	22%	73%
51-100 ha	14%	13%
101-500 ha	30%	11%
510-1000 ha	12%	2%
1001-5000 ha	18%	1%
>5000 ha	4%	0%

Source: MAPA

Through a rich history of public policies, the Brazilian government has tried to push producers of different sizes toward sustainable land management practices, which form the foundation of current efforts to convert and restore degraded pastures.

Chapter 1.2: Brazil's Agricultural Policy Landscape

Brazilian public policies for agriculture can be segmented into various groups. First, some policies provide the enabling conditions for stakeholders in the sector to plan their actions and investments over the medium and long term. These conditions provide certainty to stakeholders by establishing clear regulatory frameworks and guidelines. Then, more targeted policies give farmers access to credit, risk management mechanisms (e.g., insurance), and technical assistance. These policies provide a system of resources for farmers to operate more productively and sustainably. For converting and restoring degraded pastures, the interplay of these policies plays a crucial role in pushing farmers to the most sustainable production options possible. The most relevant of these policies are described below:

The Forest Code (Implementing Framework): Initially passed into Brazilian law in 1965, the Forest Code governs the amount of land rural property owners can legally deforest. Within the Amazon biome, at least 80% of forested areas, 35% of savanna, and 20% of grasslands must be preserved as native vegetation.[xxi] Outside of the Amazon Biome (e.g., central and southern Cerrado), only 20% of rural properties must remain regardless of the type of native vegetation. The last amendment to the Forest Code was made in 2012, which requires landowners to register their property with the CAR. To validate this registry, landowners must prove that no illegal deforestation has occurred after July 2008 through satellite images and maps showing the size of legal reserves. At the federal level, the Forest Code is enforced through the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA) and the Federal Police & Public Prosecutors (MPF). Together with state environmental agencies, they monitor compliance, issue fines, and ensure landowners adhere to the environmental regulations set by the Forest Code.[xxii]

Brazil's Nationally Determined Contribution (NDC): As part of the Paris Climate Agreement, Brazil's NDC establishes a vision for the country to transition to a resilient, low-carbon economy by 2035.[xxiii] As part of this goal, the government has committed to the ecological transformation of the country. Degraded pastures are considered a commitment issue, with the conversion of degraded pastures into sustainable agricultural and forestry production systems a crucial goal of the initiative.

Ecological Transformation Plan (Implementing Framework): Established in October 2024, the Ecological Transformation Plan is a Pact for Brazil's Executive, Legislative, and Judicial branches to make a long-term commitment toward sustainability.[xxiv] The effort represents a commitment among the three branches to act cooperatively to adopt a set of measures aimed at ecological sustainability, (ii) sustainable economic development, (iii) social, environmental, and climate justice; (iv) consideration of the rights of children and future generations; and (v) resilience to extreme climate events. Among its stipulations, the Plan emphasizes the need to restore degraded pastures using sustainable techniques such as silvopastoral systems that integrate trees with pastureland to restore native vegetation and enhance economic productivity.

PROVEG (Implementing Framework): In 2017, Brazil adopted the National Policy and Plan for Native Vegetation Recovery (PROVEG) to coordinate and promote policies for the recovery of forests and other forms of vegetation. This policy framework incentivizes producers to engage in voluntary restoration while meeting their legal obligations set in the Forest Code. To accomplish this, the accompanying Native Plan for Native Vegetation Recovery (PLANAVEG) set the goal of restoring 12 million hectares of degraded areas by 2030.[xxv] The plan's feasibility is currently under review by the Ministry of Environment and Climate Change (MMA).

Plano Safra (Implementing Policy): The Plano Safra is an annual agricultural credit program administered by MAPA with disbursements of R$400.6 billion for the 2024/2025 cycle.[xxvi] The program evolved from the 1965 Rural Credit Policy to establish criteria for sustainable agricultural production. The Plan has been central to promoting agricultural productivity and rural development for producers across the country. By providing access to various low-interest loans, the Agricultural Ministry can incentivize producers toward more sustainable practices. Examples include the ABC/ABC+ Plan, a program to support low-carbon agriculture and environmental restoration.[xxvii] The program provides farmers with financing options to implement sustainable farming techniques, such as no-till farming, agroforestry systems, and silvopastoral practices, all aimed at reducing carbon emissions. While the ABC/ABC+ Plan typically targets farmers with medium to large-scale operations, there are also instruments specific to sustainable family farming, such as PRONAF ABC+. The process for any rural producer to access these credit lines is coordinated through private financial institutions that administer applications and monitor compliance with program-specific criteria. Brazil's National Bank for Economic and Social Development (BNDES) then compensates these institutions for the loan-specific subsidy relative to prevailing interest rates.

PNCPD (Implementing Policy): Launched in December 2023, the PNCPD aims to convert 40 Mha of degraded pastureland into sustainable production systems to preserve biomes, reduce emissions and increase agricultural productivity. To support this transition, the PNCPD seeks to attract $120 billion of private capital from domestic and international sources.[xxviii] These resources complement the public resources allocated through the Safra Plan, as both programs aim to promote sustainable agricultural production systems focused on mitigating GHG emissions. The synergies with the ABC Plan make it likely that PNCPD funding will be administered through the Safra Plan's existing financing and compliance mechanisms. Based on the interviews conducted for this study, MAPA has already held conversations with the Japanese International Cooperation Agency (JICA) and the European Union for providing low-interest loans with significant grace and repayment periods for agricultural producers interested in converting degraded lands. The criteria for producers to qualify for these loans are currently being drafted by the Brazilian Agricultural Research Corporation (Embrapa).

Investment labs (Implementing Policy): Under the framework of the Ecological Transformation Plan, the Brazilian Government recently initiated its Climate and Ecological Transformation Investment Platform (BIP).[xxix] Among a range of priority sectors, the initiative promotes sustainable fuels and enhances the recovery and sustainable management of native vegetation. The program is led by the Ministry of Finance (MF) in collaboration with the MMA, the Ministry for Development, Industry, Commerce and Services (MDIC), and the Ministry of Mines and Energy (MME). BNDES acts as the Platform's secretariat, managing day-to-day operations. In addition, various public and private stakeholders, including Banco do Brasil (BB) and BNDES, launched a Nature Investment Lab in September 2024. This lab aims to bring together and address challenges in scaling nature-based solutions (NbS) to mitigate greenhouse gas emissions from agriculture in Brazil.

International Regulation: The EU Deforestation Regulation (EUDR) aims to prevent deforestation-related commodities from entering the European market. Importers into the EU will have to prove the complete traceability of their supply chains by documenting land ownership records, sustainability certifications, and geolocation data.[xxx] The regulation will apply to the following seven commodities: cattle, cocoa, coffee, oil palm, rubber, soy, and wood. The regulation was initially adopted in June 2023 and was intended to take effect in December 2024. However, due to concerns about the administrative burden and impacts on smallholder producers, the regulation was postponed beyond 2025. The EUDR builds on earlier efforts to shape supply chain accountability, sharing the same goal as the Soy Moratorium.[xxxi] In 2006, major soybean traders committed to only purchasing deforestation-free soy grown in the Amazon biome. This effort was a voluntary industry-led initiative after NGOs like Greenpeace and European buyers expressed concern about the large-scale deforestation associated with soy. Although the agreement has existed for two decades, states like Mato Grasso have recently passed laws ending tax incentives for companies imposing restrictions on legal deforestation.[xxxii]

Chapter 2.0: Challenges for Pastoral Conversion and Restoration

Brazil's agricultural policy landscape is complex, involving diverse national and international stakeholders with competing interests. On the one hand, Brazil has a strong agricultural lobby that argues for the expansion and deregulation of the sector. Particularly with growing Chinese support, agribusiness advocates emphasize the need to increase production to meet rising global food demand and strengthen Brazil's position as a leading exporter. On the other hand, sustainability-focused stakeholders have pushed for stricter regulations, enforcement of conservation laws, and incentives for sustainable agricultural practices. This dynamic has shaped Brazil's policy approach, balancing the need for economic growth and environmental protection. In this context, the conversion and restoration of degraded pastures represent an opportunity to meet these conflicting narratives by expanding agricultural production without additional deforestation.

Given the competing interests described, achieving this goal at the scale necessary to meet agricultural demand is not straightforward. As became evident during the interviews, there are four key challenges confronting the conversion and restoration of degraded pastors:

1. Inadequacy of existing policy mechanisms;
2. Imbalance of financial incentives for producers;
3. Competing priorities for degraded pasture conversion and restoration; and
4. Limited government coordination;

Brazil's government must address these challenges so that the country's producers can commit to prioritizing the conversion and restoration of degraded pastures. The sections below evaluate each challenge and explain its underlying causes and history.

Chapter 2.1: Inadequacy of Existing Policy Mechanisms

A recurring theme across several interviews is that the Brazilian government has inadequately implemented existing policy mechanisms for converting and restoring degraded pastures. One significant reason is that the institutions supervising credit disbursement through the ABC/ABC+ programs do not adequately enforce compliance. The financial institutions that administer loans for pastoral restoration and conversion are incentivized to monitor a producer's creditworthiness but are not focused on whether the environmental criteria relevant to loan disbursement are met. A CPI study from September 2024 illustrated these issues, highlighting that obtaining low-interest credit for pastoral recovery through the ABC/ABC+ plan reduced land degradation by an average of only three percentage points over four years.[xxxiii] This impact increases to six percentage points for producers that received technical assistance and a maximum of ten percentage points when considering a 6-year time frame. In addition, some areas declared for pastoral recovery had only recently been deforested, contradicting the requirements for exhibiting sustainable practices before receiving low-interest credit. These findings imply that existing public programs have had little success converting and restoring degraded pastures by achieving only 0.9% to 2.5% of the ABC Plan's goal to recover 15 Mha between 2010 and 2020.

Another issue worth noting is that the existing financing mechanisms for degraded pastures mainly cater to medium-sized agricultural producers. However, as illustrated in Table 1, 73% of properties that have degraded land are small-holder farmers. Within this group, only 20% of producers whose properties span 10 to 100 hectares take out credit, which drops to 10% for producers with properties up to four hectares.[xxxiv] In addition, credit access varies by region. In the South, 29% of small-holder producers access credit, whereas this proportion drops to 9% in the North. The reasons for credit aversion can be segmented by both the demand and the supply side. From the farmers' perspective, applying for loans through the PRONAF credit line is costly as many rely on external consultants to develop the project outline and apply to the bank. Fees for such services can add up to 2% of total loan disbursement and do not include technical assistance for implementing the project.[1] However, interviewees also pointed toward cultural components. Farmers were only willing to engage in certain sustainable practices if they saw their neighbors doing so successfully. Being able to overcome this inertia through successful case studies is therefore crucial. On the supply side, banks have stringent capital requirements for offering credit. They typically do not accept certain types of collateral (e.g., cattle) and prefer to work with producers they have relationships with. To illustrate this further, a financial institution assisting rural families in restoring degraded pastures with cocoa agroforestry systems in the Amazon rejected credit applications for 72% of smallholder farmers.[xxxv] Because specialized companies implementing these projects had limited operational capacity to assist producers

[1] The 2% estimate was referenced during several stakeholder interviews as an approximate benchmark.

due to logistical challenges, the financial institution could not accept the higher credit risk.

Given this, having adequate technical assistance is crucial in helping farmers achieve better restoration and conversion results. Certain credit lines under the ABC/ABC+ programs have technical verification requirements that encourage producers to seek technical assistance. However, as already discussed, financial institutions do not adequately supervise the technical verification of sustainable practices. The National Confederation for Agriculture (CNA) and its National Rural Learning Service (SENAR) are crucial for overcoming these barriers by providing technical assistance and capacity-building programs for rural producers. Their involvement ensures that farmers can access credit for low-carbon agriculture and receive the necessary knowledge and skills to implement sustainable practices. Integrated forest and livestock systems, in particular, require such assistance, as these systems are technically challenging to implement and can easily waste resources. Despite the program's potential, SENAR's reach is limited, especially in remote areas where many smallholder farmers operate. Understanding how the service can coordinate with MAPA and the financial institutions providing credit will be crucial to making future policy efforts (e.g., the PNCPD) more successful.

Chapter 2.2: Imbalance of Financial Incentives for Producers

Financial incentives contributing to deforestation in Brazil must be understood when trying to incentivize producers away from clearing native vegetation toward converting and restoring degraded lands for agricultural production. Several interviews reiterated that it is attractive for producers to clear new lands as the property value of the deforested land immediately increases. This finding is supported by empirical research that shows that agricultural output prices influence deforestation rates in the Brazilian Amazon and the Cerrado.[xxxvi] This effect is only balanced by regions with punitive environmental laws as the financial opportunity to deforest is reduced by the risk of fines and legal enforcement. However, in areas where monitoring and enforcement are weak, the short-term economic gains from deforestation outweigh the risks. Additionally, newly deforested land can be used as collateral for credit as banks understand how to value such lands. Standing forests, in comparison, are not commonly used as there is no clear market price for such assets. Degraded pastures are also less attractive due to low agricultural yields and valuations.

Another financial incentive for deforestation mentioned during interviews is the immediate cash flows associated with selling timber. States like Pará and Rondônia are among the country's largest timber producers, where illegal deforestation and logging are connected to environmental crime. According to a study by the Igarape Institute, 87% of this activity occurs inside the legal Amazon, implicating 166 cities in an unlawful logging ecosystem.[xxxvii] This widespread illegal deforestation undermines efforts to promote sustainable land use, particularly initiatives to convert and restore degraded pastures. Without enforcement mechanisms, landowners may opt for deforestation rather than investing in pasture recovery, reinforcing a land degradation cycle. One study even estimated that less than 3 percent of illegal logging alerts resulted in formal actions for producers, a gap exacerbated by a lack of institutional capacity to monitor and fine violators effectively.[xxxviii]

Chapter 2.3: Competing priorities for degraded pasture conversion and restoration

When considering converting and restoring degraded lands, each Brazilian state has different competitive advantages for transforming these pastures. In its analysis, MAPA allocated potential end uses to a range of sustainable production systems for the states Mato Grosso, Mato Grosso do Sul, Goiás, Pará, Tocantins, Rondônia, São Paulo, Minas Gerais, and Bahia, as shown in Table 2.[xxxix] The initial investment per hectare and the emissions removal benefits vary tremendously across these production systems, incentivizing producers differently depending on their priorities. For example, beef and cattle intensification (R$5,145) is 16% more cost-effective than the second least expensive option, soybean cultivation. On the other end, agroforestry systems are significantly costlier than any other production system at R$31,378. However, the emissions benefits from agroforestry significantly outweigh those of other systems.

Table 2. Estimated aggregate costs, investments, and emissions

Sustainable production system	Area selected by system	Initial investment (R$/ha)	Total initial investment (thousand R$)	Operating costs per year (R$/ha)	Emissions Removal Factor: tCO2 HA-1 YEAR-1
Beef and Cattle Intensification	12,202,094	5,145	62,773,887	2,285	-2.24
Crop-livestock integration	4,179,816	6,121	25,584,515	5,403	-2.24
Soybeans or soybeans + 2nd crop corn	4,053,532	6,099	24,723,586	8,598	-1.84 to 1.47
Forestry	2,229,175	8,825	19,671,692	1,933	-0.81
Livestock-forest integration	389,875	7,929	3,091,336	3,069	-5.51
Agroforestry system	100,000	31,378	3,137,827	134	-7.33
Total	23,154,492	--	138,982,841	--	--

Source: MAPA

An additional factor that producers consider closely is the payback period of each production system. The time required for producers to see any yield on their investment is typically a few years for agricultural cultivation (e.g., soy, corn) but tends to be much longer for reforestation efforts. One interviewee highlighted this tension, underscoring how it took ten to twelve years to recover a reforestation-based investment. Given these long tenors, the demand from institutional and impact investors for reforestation has been limited compared to alternative systems that offer quicker financial benefits and proven business models. To account for these differences, public policy is essential in reducing the financial barriers toward the range of sustainable production systems.

Chapter 2.4: Limited Government Coordination

As discussed in section 1.3, public policies for Brazil’s agriculture sector involve the responsibility of various Ministries. For converting and restoring degraded pastures, MAPA is considered the primary Ministry responsible for encouraging sustainable transitions through programs such as ABC/ABC+, while pursuing its goal of converting and restoring 40 Mha. However, the activities of other Ministries are directly related to MAPA’s ability to reach its goals. In particular, close alignment between MAPA and MMA is essential, given the interconnection between climate change and agriculture. For instance, MMA has issued a similar goal to that of MAPA by aiming to restore 12 Mha of degraded areas by 2030. Despite this, several interviewees mentioned that the Ministries have struggled to cooperate on initiatives. This is driven partially by the political uncertainty surrounding MMA’s mandate, which has been weakened by the transfer of key responsibilities (e.g., supervision of the CAR) and proposals for turning MMA into an internal secretariat for MAPA.[xl]

Beyond ministerial coordination, MAPA's effective collaboration with other federal entities was mentioned as an opportunity for improvement. The scope of the 27.7 Mha degraded farmland that MAPA considers eligible for its programs can only be expanded by working with producers currently deforesting illegally. However, these activities fall under the jurisdiction of the IBAMA, the Federal Police, and the Federal Prosecutor's Office, which are leading government entities investigating and prosecuting environmental crimes. During the interviews, several participants noted that despite initial efforts to engage illegal producers in transitioning to sustainable practices, the relevant Ministries and Agencies had not yet agreed on a process for doing so. Specifically, they highlighted that many producers engaged in illegal deforestation operate in legal uncertainty, facing fines or land-use restrictions from IBAMA while lacking clear pathways to participate in MAPA's restoration initiatives. Effective coordination between these groups may represent the more promising option to transition producers toward sustainable practices through financial incentives, technical support, and punitive enforcement.

Chapter 3: Recommendations for Brazilian Policymakers

The Brazilian government faces challenges promoting the conversion and revitalization of degraded pastures at scale through existing financing and institutional structures. Solving these challenges requires a mixture of **institutional changes** and **risk-reducing mechanisms** to support producers in their quest to transform degraded pastures.

The policy recommendations described in this report aim to mitigate some of these central challenges and have been selected based on three criteria. The first criterion is that policy recommendations must be implementable by existing Brazilian Ministries and institutions. By doing so, implementing the policy recommendations does not rely on creating new institutional capacity but rather on leveraging current governmental bodies' resources and capabilities. This approach ensures a better integration into existing frameworks, reducing bureaucratic hurdles and accelerating implementation. The second criterion is that recommendations are based on industry experiences. There is a landscape of derisking mechanisms and financial structures intended to incentivize producers toward sustainable agricultural practices that have shown varying levels of success. Drawing on lessons learned from these structures allows policy recommendations to be tailored toward addressing existing financing gaps and enhancing effectiveness. Particularly for participating financial institutions, policy recommendations must assess the financial risks these institutions face when providing credit. The final criterion is that for a recommendation to be included, at least three interviewees must have agreed that its implementation would reduce a key barrier toward supporting pasture conversion and revitalization. This criterion ensures that the recommendations are validated by practitioners with firsthand experience in the sector. By incorporating insights from multiple stakeholders, such as financial institutions, agribusiness representatives, and policymakers, the recommendations are more likely to be practical and impactful.

Chapter 3.1: Enforcement of Punitive Measure

Illegal deforestation is an issue for degraded pastures because it incentivizes land expansion rather than using degraded areas more productively. The two primary levers against illegal deforestation have been the enforcement procedures implemented by IBAMA by imposing environmental fines, as well as international policies and agreements restricting the purchase of agricultural produce from illegally deforested lands (e.g., EU Deforestation Regulation).

Given the institutional constraints described in Section 2, the recommendation is to strengthen enforcement mechanisms by improving the institutional capacity to process cases faster. Adequate staffing levels to assess deforestation alerts, conduct investigations, and issue penalties are essential to closing the enforcement gap. With IBAMA having recently invested in remote monitoring technology (i.e., 163 remotely piloted drones), the organization has the capacity for successful environmental monitoring.[xli] This capability needs to be supported by a judicial system that can collect fines and hold illegally operating producers responsible.

This approach complements punitive policy measures such as the EUDR. However, interviewees criticized the policy for taking an incomplete approach to tackling illegal deforestation. Since the EUDR only applies to regions considered forests, the policy creates a perverse incentive to shift agricultural supply chains toward areas like the Cerrado, where deforestation pressures are lower. Meanwhile, regions like the Amazon biome, facing stricter compliance requirements, redirect their exports away from Europe toward markets such as China and India, where anti-deforestation policies are not in effect. This dynamic undermines the effectiveness of the EUDR by redistributing deforestation-driven production rather than addressing the drivers of land-use change. In implementing the policy, the recommendation is for MMA and MAPA to work with European authorities to consider any driver of illegal deforestation problematic, independent of product offtake. Although such a recommendation is difficult to implement given the size of the Brazilian agricultural sector, it would help ensure that anti-deforestation efforts address the root causes of land-use change rather than merely shifting production to different markets.

Chapter 3.2: Collaboration for Bringing Farmers into Compliance

As discussed in section 1, 40.7 Mha of degraded farmland belongs to farmers who do not comply with the Brazilian Forest Code and are ineligible for receiving public credit through the PNCPD and the ABC/ABC+ programs. As this area is nearly twice as large as the areas currently available for public credit, it is crucial to find ways of supporting these producers to make regions more agriculturally productive while preventing new deforestation from occurring. Current approaches for bringing producers back into compliance center around environmental restoration and fines for engaging in illegal deforestation. However, degraded pastureland represents an additional opportunity for compliance. Agroforestry and livestock-forest integrated systems, for example, not only offer significant environmental benefits but also provide farmers with a viable revenue stream, making compliance more economically sustainable.

The first step in setting up such a program would focus on defining the environmental criteria that allow farmers to regain compliance by investing in degraded pastures. Because the goal of such a program would be to restore the biome that was illegally deforested, restoration systems represent the most viable pathway to achieving ecological recovery. By establishing clear benchmarks for compliance through minimum reforestation thresholds and biodiversity restoration targets, the program can ensure that investments in degraded pastures lead to meaningful ecological gains. Stakeholders in such a program would include various ministries, including MMA, MAPA, IBAMA, and the Federal Police. The program's success would depend on effective communication between these entities to implement a robust monitoring framework by overseeing implementation and leveraging satellite imagery to track progress and ensure compliance. To ensure inter-ministerial cooperation, the program should establish a centralized coordinating body responsible for aligning objectives, streamlining decision-making, and facilitating data sharing among agencies.

An outstanding question would be whether such producers could access low-interest public credit to implement these systems. On the one hand, offering low-interest public credit could be a powerful incentive, making compliance financially viable for producers who might otherwise struggle to invest in restoration. On the other hand, this approach risks rewarding producers who engage in illegal practices by offering cheap credit intended for farmers compliant with the Forest Code. Given this, the recommendation is for producers to have phased access toward subsidized rates. Once producers demonstrate progress in reaching certain sustainability thresholds (e.g., reforestation or biodiversity), they can become eligible for lower-interest public credit. This is a valuable approach for reforestation because the timeline for implementing these systems is significant. Therefore, the approach balances financial support with accountability, encouraging a longer-term investment into restoring degraded pastures. Moreover, integrating a monitoring framework that links credit access to compliance milestones would strengthen oversight and ensure that public resources are effectively used.

Chapter 3.3: Dedicated TA Facility

SENAR is Brazil's primary technical assistance vehicle. CNA runs the program, representing over five million small, medium, and large-scale farmers engaged in various areas of agriculture and livestock.[xlii] The Technical and Management Assistance program was created 11 years ago and provides farmers with free two-year assistance for implementing sustainability and productivity measures. SENAR has partnered with MAPA to provide technical assistance and training for the ABC/ABC+ programs in the past, which have significantly improved the productivity of producers receiving such assistance. Specifically, one RCT indicated that technical assistance increased profits by 38% for an ABC program in the Cerrado.[xliii] In addition, each Brazilian state has a rural extension agency (i.e., EMATER) that provides localized technical support, training, and consultancy for family farmers.

Despite the availability of this technical assistance, interviewees argued that only a few producers can take advantage of it because the programs are targeted toward larger producers in central areas of the supply chain. Specifically, smallholder farmers do not have access to the training required to implement integrated agricultural systems. Given discrepancies in access, the recommendation is to have a dedicated technical assistance facility tied to the loan application process for public programs. On average, interviewees mentioned that producers pay about 2% of credit disbursement amounts toward loan application fees. Instead of these fees going entirely to the financial institutions disbursing credit, a portion could go to the technical assistance providers, ensuring that farmers receive the necessary support to enhance productivity and sustainability. Given SENAR’s experiences in the field, the organization would ideally expand its capacity to provide targeted training programs tailored to various conversion and restoration uses. This approach is also in the interest of financial institutions because it reduces credit risk. Through the technical assistance SENAR provides, producers can improve their ability to meet loan requirements by implementing sustainable agricultural practices successfully. This, in turn, increases the likelihood of successful loan repayment, benefiting both the credit standing of producers and the financial institutions.

Chapter 3.4: Guarantee Facility for Degraded Pastures

The final two recommendations center on reducing the cost of capital for producers, thereby incentivizing greater credit access. Because resources for allocating credit to rural producers are uneven, the financial institutions facilitating these programs (e.g., ABC/ABC+) see varying risk levels depending on the producer's size and agricultural output. Financial institutions prefer medium-size producers with predictable cash flows from commodity crops such as soy and corn. More complex interventions with longer credit tenors are inherently riskier as they are subject to more uncertainties, including market volatility, climate variability, and policy change across an extended payback period. Because these systems (e.g., restoration and agroforestry systems) offer considerable emissions and climate benefits, promoting policies that can redirect resources toward financing these practices is crucial.

To accomplish this goal, guarantee facilities can be essential in ensuring financial institutions are willing to extend long-term finance for complex conversion and restoration practices. A guarantee facility is a financial mechanism in which a financial institution provides a guarantee to another party, promising to cover a specific financial obligation or risk if the original borrower of a loan defaults. The Brazilian government offers several federal guarantee facilities for agricultural practices, including the Rural Insurance Premium Subsidy Program (PSR), the Guarantee Program for Agricultural Activities (PROAGRO), and the Garantia Safra Program. The primary aim of these programs is to reduce the cash flow volatility of producers in the agricultural sector. PROAGRO and the Garantia Safra Program compensate producers in response to losses arising from weather events, where Garantia Safra targets specifically small-scale farmers.[xliv] On the other hand, the PSR is an economic subsidy to the rural insurance premium, reducing the cost of insurance policies for producers. Building on these programs, a dedicated guarantee facility for degraded pasture conversion and restoration would provide lenders and producers greater financial security. The percentage of the credit covered by the guarantee should be relative to the riskiness of the activity. Higher-risk systems such as agroforestry and restoration could receive a higher guarantee percentage to incentivize financial institutions to extend credit for these systems.

Additionally, the facility could be structured to provide higher coverage for small-holder farmers, as they represent 73% of properties eligible for the PNCPD and generally have lower access to subsidized credit. Since the PNCPD is currently being rolled out, the program is ideal for incorporating a dedicated guarantee facility to test and refine the insurance amounts that allow financial institutions to support the provision of credit more widely. EcoInvest, an initiative to catalyze private investment from domestic and international sources, is the ideal place to administer this program. The initiative is managed by BNDES and is designed to derisk investment in the agriculture sector by combining public resources with private capital. In addition, according to several interviews, the PNCPD will operate through EcoInvest. Financial institutions providing credit to farmers will bid on subsidized credit lines through the EcoInvest platform, making the process competitive. A guarantee facility for the PNCPD would fit into this mechanism nicely and allow the facility to be tested before expanding to other rural credit programs. Like other credit lines, the financial institutions participating in the PNCPD would bid for the guarantees, ensuring an efficient and market-driven approach to their allocation (i.e., the financial institution bidding for the lowest guarantee amount per system would receive the allocation).

Chapter 3.5: Variable Interest Rates

Similar to guarantee facilities, interest rates are a financial mechanism to incentivize farmers toward sustainable agricultural practices. The interest rates on existing programs vary according to the government program. PRONAF offers interest rates between 0.5% and 6% depending on the credit line, while the interest rate set by the Brazilian Agricultural Plan was 7% in the crop year 2024/2025[xlv, xlvi] These interest rates are lower than Brazil's benchmark interest rate (i.e., the Selic rate), providing farmers with cheaper access to credit for agricultural interventions. For the conversion and restoration of degraded lands, medium and large producers currently take advantage of the interest rates provided by the Brazilian Agricultural Plan, whereas smallholder farmers are entitled to the PRONAF rates.

Although these interest rates vary by government program, they do not differ significantly enough to push farmers toward complex agricultural systems. For PRONAF financing lines, agroecology interest rates are between 3 and 4%, the same as the financing line for commodities such as beans, rice, cassava, milk, fruits, and vegetables. For the ABC program, the financing line for conversion and restoration (i.e., ABC Recuperação) provides the same interest rate as the Brazilian Agricultural Plan and does not distinguish economic use. As a result, producers lack a financial incentive to adopt more diversified agricultural practices, as credit costs remain relatively uniform regardless of the system's complexity.

Thus, the National Monetary Council (CMN), which sets the interest rates for public programs, should consider offering a range of interest rates that more closely consider the system's true financial costs and timeline for implementation. Because CMN determines these rates based on recommendations from MAPA, the Ministry can use its experiences engaging with farmers to determine the appropriate rates to incentivize adopting sustainable agricultural practices across different production systems. Embrapa, the Agricultural Ministry's Research Corporation, is the ideal body for determining these rates as it has extensive research on the competitiveness of the Brazilian bioeconomy. By leveraging Embrapa's insights, MAPA can recommend differentiated interest rates that align with the cost structures and expected cash flow timelines of different systems, whether agroforestry, integrated livestock forests, or crop conversions. Like the approach suggested for guarantee facilities, the PNCPD represents an opportunity to test the interest rates before expanding them to all public credit programs. Since EMBRAPA has already determined the optimal allocation of PNCPD funds (i.e., Table 2), flexible interest rates should be the financial tool for implementing those production systems.

Chapter 4: Conclusion

Various economic, institutional, and enforcement barriers make promoting large-scale degraded pasture conversion and revitalization in Brazil challenging. This report's policy recommendations address these challenges by improving institutional capacity and coordination while reducing financial risks.

Improving institutional capacity to ensure compliance with the Brazilian Forest Code is the foundation for these changes. Current enforcement gaps highlight the need for increased coordination among various ministries and agencies to accelerate and enhance enforcement processes. Ensuring that IBAMA, MAPA, MMA, and the Federal Police have the resources and coordination needed to act swiftly against environmental violations will reinforce the credibility of Brazil's forest conservation policies.

In this context, degraded pastures can be seen as an opportunity to bring non-compliant farmers into compliance. With nearly 40.7 million hectares of degraded farmland owned by farmers who lack access to public credit due to non-compliance, integrating these producers into sustainable land use programs is essential. Establishing clear environmental restoration benchmarks and linking phased access to subsidized credit with compliance milestones can balance financial support with accountability. This approach ensures that incentives encourage long-term investments in ecological restoration without inadvertently rewarding past illegal practices.

Finally, risk-reducing financial mechanisms, such as a dedicated guarantee facility, variable interest rate structures, and technical assistance, can push producers toward more diverse conversion and restoration systems that offer significant food and climate benefits. Specifically, the guarantee facility aims to mitigate the credit risks that deter banks from extending loans to smallholder producers and complex restoration projects. Technical assistance has a similar goal of reducing production risks, whereas variable interest rates are a positive incentive to push producers toward more complex agricultural systems. These financial tools create a flexible credit environment that improves the demand and supply of investing in various agricultural systems.

Together, these policy recommendations offer a comprehensive strategy for addressing the barriers hindering sustainable pasture conversion and restoration in Brazil. By aligning financial incentives with conservation objectives, enhancing enforcement mechanisms, and fostering collaboration across ministries, the country can build a more resilient agricultural sector that supports economic growth and environmental sustainability. As the PNCPD is rolled out, these recommendations provide a foundation for scalable and effective interventions to drive meaningful change in land-use practices.

Appendices

Appendix A: Organizations Interviewed

- BV Rio
- CPI PUC-Rio
- Fundo Vale
- Caaporã
- Sail Investments
- IFACC
- Santos Neto Advogados
- ITAU BBA
- Instituto Clima e Sociedade (iCS)

Appendix B: Glossary of Key Abbreviations

1. **Agencies and Ministries**

BB: Banco de Brasil

BNDES: National Bank for Economic and Social Development

CAR: Rural Environmental Registry

EMBRAPA: Brazilian Agricultural Research Corporation

IBAMA: Brazilian Institute of Environment and Renewable Natural Resources

MAPA: Brazil's Ministry of Agriculture and Livestock

MF: Ministry of Finance

MMA: Ministry of Environment and Climate Change

MME: Mines and Energy

MPF: The Federal Police & Public Prosecutors

2. **Public Programs**

BIP: Climate and Ecological Transformation Investment Platform

CAR: Rural Environmental Registry

PLANAVEG: Native Plan for Native Vegetation Recovery

PNCPD: The National Program for the Conversion of Degraded Pastures into Sustainable Agricultural and Livestock and Forestry Production Systems

PROAGRO: Guarantee Program for Agricultural Activities

PROVEG: National Policy and Plan for Native Vegetation Recovery

PSR: Rural Insurance Premium Subsidy Program

3. **Other**

CNA: The National Confederation for Agriculture

EUDR: EU Deforestation Regulation

GDP: Gross Domestic Product

JICA: Japanese International Cooperation Agency

Mha: Million hectares

NbS: Nature-based Solutions

NDC: Nationally Determined Contribution

SENAR: National Rural Learning Service

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