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Anti-deforestation policy and supply chain governance: Perceptions by cattle ranchers and soy farmers in Brazil

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Abstract

Deforestation in the Amazon and Cerrado, Brazil's two largest and most biodiverse biomes, is largely driven by the advance of the agricultural frontier toward forestland. Most of the areas converted in the last 20 years became either monocrop plantations or cattle pasture. From a socio-legal standpoint, this raises the question of how to regulate supply chain relationships in order to reduce land-use change associated with soy and beef production. Drawing on documental analysis and semi-structured interviews, this research sheds light on the governance structure and frames of thought sustaining the soy and cattle value chains that influence producer behavior and expectation toward anti-deforestation policy. The paper concludes that preventing deforestation while generating income also requires reversing the deterioration in the terms-of-trade. The short-sightedness of Brazilian landowners who are disinterested in industry and share a deep-seated identity centered around agriculture and livestock remains a major obstacle in the pursuit of development.

Key words

Environmental law and policy; political economy of deforestation; soy and cattle supply chains; traceability; Brazilian Amazon and Cerrado

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Resumen

La deforestación en la Amazonía y el Cerrado, los dos biomas más grandes y con mayor biodiversidad de Brasil, está impulsada en gran medida por el avance de la frontera agrícola hacia las zonas forestales. La mayoría de las áreas convertidas en los últimos veinte años se transformaron en plantaciones de monocultivo o pastizales para ganado. Desde un punto de vista sociojurídico, esto plantea la cuestión de cómo regular las relaciones de la cadena de suministro para reducir el cambio en el uso del suelo asociado a la producción de soja y carne de vacuno. Basándose en análisis documentales y entrevistas semiestructuradas, esta investigación arroja luz sobre la estructura de gobernanza y los marcos de pensamiento que sustentan las cadenas de valor de la soja y el ganado, que influyen en el comportamiento de los productores y en sus expectativas respecto a la política de lucha contra la deforestación. El artículo concluye que, para prevenir la deforestación y generar ingresos, también es necesario revertir el deterioro de los términos de intercambio. La miopía de los terratenientes brasileños, que no se interesan por la industria y comparten una identidad profundamente arraigada y centrada en la agricultura y la ganadería, sigue siendo un obstáculo importante para el desarrollo.

Palabras clave

Derecho y política medioambiental; economía política de la deforestación; cadenas de suministro de soja y ganado; trazabilidad; Amazonía y Cerrado en Brasil

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1. Introduction

Deforestation in Brazil is indisputably caused by the expansion of soy and cattle production over forest areas (Margulis 2004, Gibbs *et al.* 2015, Assunção *et al.* 2023). Given this *commodity-oriented* nature, the traditional environmental policy toolkit to halt deforestation (command and control, tax incentives, etc.) has been complemented with what has been called *supply chain regulation*, through which state authorities or market players impose due diligence obligations on intermediate actors of a production chain with the objective of steering compliance by their suppliers (Scott 2019, Gustafsson *et al.* 2023). Examples are the European Union Regulation for Deforestation-Free Products (EUDR), the Corporate Sustainability Due Diligence Directive (CSDDD) and the non-prosecutorial agreements between the Brazilian Public Prosecutor's Office and slaughterhouses.

Supply chains are shaped by asymmetric relations of power and authority that determine how "financial, material, and human resources are allocated and flow" between primary producers, manufacturers, and retailers (Gereffi 1995, 113). Those focused on low value-added commodities such as soybean and cattle are characterized by the literature as *buyer-driven*, meaning that global buyers with no direct ownership over primary production assets (such as Cargill and JBS, respectively the world's largest soy trader and slaughterhouse) successfully exert a huge amount of power over offshore suppliers, being able to extract price concessions and "specify in great detail what, how, when, where, and by whom the goods they sell are produced" (Sturgeon 2008, 7).

Supply chain regulation, therefore, relies on the assumption that the lead firms are capable of enforcing supplier compliance through their superior bargaining power and threat of sanctions such as embargo and disengagement. To monitor thousands of suppliers, traceability—that is, the ability to track the exact plot of land where and how a product was made—, is paramount.

Within this context, the paper addresses the perceptions of rural producers operating in the Brazilian biomes of Amazon and Cerrado about traceability as a tool to enforce environmental norms. More specifically, it aims to understand the frames of thought shared by these actors and how these schemes have influenced their behavior and expectation toward traceability, with a focus on the non-prosecutorial agreements proposed by Brazil's Public Prosecutor's Office.

As socio-legal theorists have repeatedly argued (Neves 2022, Ramsauer 2024), the efficacy of law and policy—that is, the degree to which their declared overall objectives are accomplished (Blankenburg 1984)—largely depends on the worldview shared by the addressees in society, as values and beliefs directly influence compliance. Research that neglects the subjective dispositions of those affected by environmental restrictions runs the risk of underestimating the problem, offering incomplete diagnoses, and proposing naive and unenforceable recommendations to policymakers. Conversely, legal norms and public policies that are oblivious to the mentalities of their addressees, may end up being systematically breached, thereby demoralizing the implementing body, and, ultimately, generate a political backlash.

The paper's contribution to the literature is twofold. At a theoretical level, it connects the classic sociological inquiry on the efficacy of law and policy with concepts from supply

chain governance. This expands the vocabulary available to socio-legal research to discern the patterns of meaning that guide the behavior of commodity producers based on the agribusiness frontier, helping to capture detailed insights into the micro-interactions within global value chains that shape the political economy of deforestation. At an empirical level, the in-depth case study sheds light on the factors that curtailed the efficacy of Brazil's most comprehensive forestry policy, which is credited with having drastically reduced deforestation in the Amazon in its first decade of implementation and resulted in the largest individual contribution ever made by a single country to mitigate climate change (Capobianco 2021).

2. Methodology

The empirical data comprises documental sources (notably the non-prosecutorial agreements and their corresponding audit reports, alongside policy documents) and semi-structured interviews conducted from October 2021 to May 2022 with civil servants, political officials, federal prosecutors, NGO representatives, soy farmers, and cattle ranchers. This paper engages more directly with the answers of rural producers (N=15), as farmers are the immediate addressees of anti-deforestation policies, those whose behavior the government's efforts are most dedicated to influencing, and prosecutors (N=4), since the Public Prosecutor's Office took the lead in implementing traceability in the soy and cattle production chain, and this was one of the tools most often mentioned and commented by farmers.

2.1. Interviews

The interview scripts were tailored for each type of actor. The interviews with the farmers addressed the following topics: their motivation to settle in the Amazon region and general characteristics of their businesses; the changes they perceived occurring in their surroundings since they settled in the area; their interactions and perceived bargaining power vis-à-vis with other actors in the supply chain (especially soy traders or slaughterhouses); their motivation for associating or not associating with rural unions; their perceptions of anti-deforestation policies in general and traceability in particular; their visions of development and alternatives of future; and finally, the self-image they project of their social role.

The construction of the interview scripts was based upon open-ended questions and "prompts", following the methodology proposed by Leech (2002). Open-ended questions benefited from a "grand tour" format, in which interviewees are asked to take a verbal tour of a subject they know well. These questions had the advantage of making the interviewee reflect on regularities, repetitions, and patterns. "Could you describe a typical negotiation with a meatpacking plant? What is the step-by-step process of an inspection operation against deforestation? Could you reconstruct the most decisive events in your professional career?", are some examples of grand tour questions used. Prompts were important complements to open-ended questions. They were used to probe a specific issue if the interviewee did not bring it up. For example, for the question "How do you perceive the profitability of cattle raising in relation to other opportunities available to you?", the prompts "compared to planting soybeans or leasing land" were planned. If the farmer did not spontaneously mention alternative economic activities when answering about perceived profitability, they were brought into the conversation

in order to ascertain the extent to which they would appear as viable options on their horizon.

As in any semi-structured interview, the script provided only a basis for conversation with the interviewees. Sometimes questions were grouped together or omitted, and at other times new questions were spontaneously formulated due to the flow and pace of each interview.

As for the corporations operating in the second tier of the soy and cattle supply chains and the agribusiness associations of which they are members, only one trader and one slaughterhouse answered our emails, despite all the efforts made by these companies and associations to structure public relations departments. Both requested the questions in advance. Once in possession of the questionnaire, the soy trader stopped responding. The slaughterhouse replied that "after internal discussion, [they] chose not to proceed with the in-depth interview." The slaughterhouse's public relations manager also referred me to their sustainability reports available online.

The interviews were recorded with the explicit consent of the interviewees and transcribed using Trint software. The software only reduced the transcription workload by about 30%; most of the recordings were transcribed manually. Approximately 60 hours of recordings were converted into almost 700 pages of transcripts. Each interview took an average of 1 hour and 20 minutes. In addition to the interviews, two other cattle ranchers answered questions in writing. Any information that could lead to the personal identification of the interviewees was anonymized. Individual names, farm names, biographical information and specific events in which the person was involved were omitted or presented in more aggregated and generic formulations.

2.2. Fieldwork location

The interviews with rural producers took place in Araguaína, Tocantins, and in Redenção, Pará. Araguaína is located at the threshold between Amazon and Cerrado, while Redenção is located in the Amazon. The Amazon and the Cerrado are Brazil's and South America's two largest biomes, which play both a fundamental role in the provision of ecological functions that sustain human and other-than-human life in the continent.

The Amazon is the world's largest rainforest and biodiversity hotspot, a major carbon sink, an important regulator of temperature, humidity, and rain patterns. It shelters the largest river basin on the planet, with 25,000 kilometers of navigable rivers (Azevedo-Ramos 2001, Pivetta 2019), and represents 67% of the world's tropical forests, sheltering 30% of all trees and 20% of all fresh waters on the planet (Imazon 2013, Scientific Panel for the Amazon 2025).

Less internationally known but equally important from an ecological viewpoint, the Cerrado is home to important water recharge areas, playing a fundamental role in the distribution of water to the main Brazilian and South American river basins (Santos *et al.* 2020). Of the country's twelve main hydrographic regions, eight have their sources in the region, including the Amazon basin (Coe *et al.* 2017). It is an important producer of fresh water and rainfall connector for all other Brazilian biomes, being located over the largest and deepest freshwater aquifers on the continent (Castro *et al.* 2019).

Together, the Amazon and Cerrado store 23.4 billion tons of organic carbon in the first 30 centimeters of their soils alone, which is equivalent to 58 years of Brazilian greenhouse gas emissions (Mapbiomas 2023). The two biomes have a relationship of interdependence and complementarity: The humidity from the Amazon reaches the Cerrado in the form of rainfall, which, in turn, infiltrates the Cerrado's deep soil and flows into the rivers, distributing water throughout the whole of Brazil and also back into its partner biome (Pinto *et al.* 2009).

Closer access to the inner circle of farmers and ranchers was the primary criterion for choosing Araguaína and Redenção as fieldwork settings. Both municipalities are located in regions of "consolidated frontier," whose administrative foundation dates back respectively to the 1950s and 1970s. Most of the interviewees, however, practiced some kind of economic activity in regions of "new frontier," in lands that lacked titling and environmental regularization. The cities' characteristics thus made them optimal locations to grasp the schemes, assumptions and frames of thought subtending the farmers' decisions to advance over the forest, to observe how capital flows from one region to the other and helps to finance novel fronts of deforestation.

2.3. Documental analysis

Historically, deforestation in the Brazilian Amazon and Cerrado can be divided into two cycles. The first occurred from the 1960s to the mid-1980s, motivated by highway constructions, subsidized credit, and colonization policies induced by military governments with the geopolitical goal of consolidating "national sovereignty" over the Central-West and North regions. The second cycle started in the 1990s, motivated by low-value-added economic activities, mostly monocrop agriculture and cattle ranching. After the incentives implemented by military governments were gradually phased out, crops and cattle proved to have become economically viable in the Central-West and the North on their own, even without the full array of subsidies formerly in place. The dynamics of deforestation, thus, changed from geopolitically-led to commodity-driven (Becker 2005, p. 80). Activities related to commodity production are interdependent: the arrival of more capitalized and technologized large-scale agriculture in regions of "consolidated frontier" elevates land prices and pushes the opening of "new frontiers" by loggers, speculators and less professionalized ranchers (Margulis 2004).

Deforestation prevention and control have been pursued by the Brazilian federal government from the 2000s onward through two main policies: The Action Plan for the Prevention and Control of Deforestation in the Amazon (PPCDAm; Ministério do Meio Ambiente e Mudança do Clima) and the Action Plan for the Prevention and Control of Deforestation and Forest Fires in the Cerrado (PPCerrado; Ministério do Meio Ambiente e Mudança do Clima).

The PPCDAm began in 2004 and is now in its fifth phase. It aims to promote sustainable development in the Amazon by implementing an economic model based on the valorization of the region's rich sociobiodiversity, with a view to raising the standard of living of the Amazonian population. The plan is structured around 3 main axes: (1) territorial planning, which defines rules of access to land and guidelines for the use and exploitation of natural resources, by establishing strategic areas for conservation and sustainable use; (2) monitoring and control, whose goal is to consolidate the effective

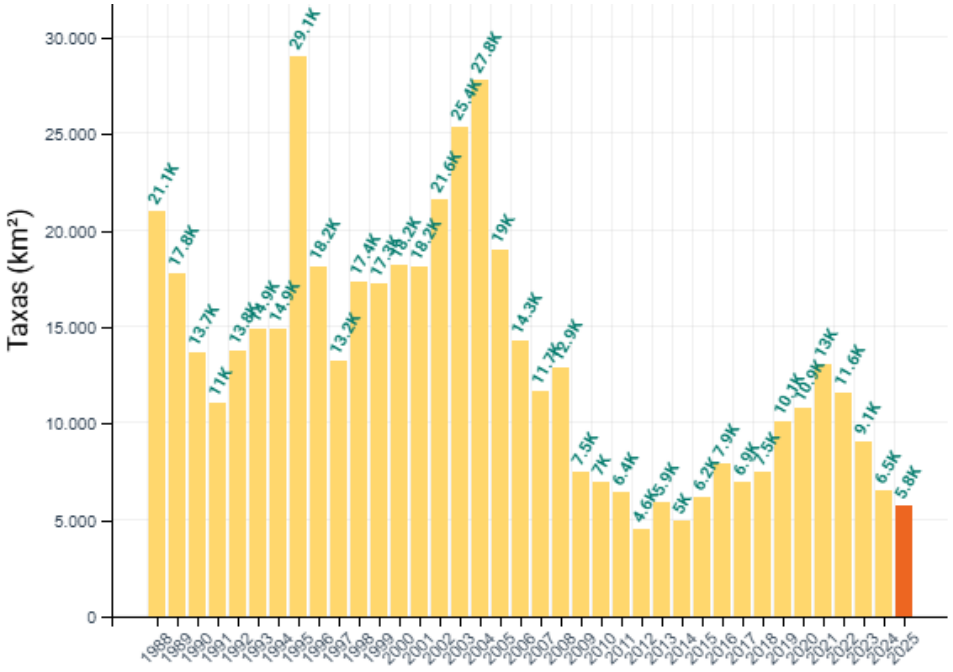
and definitive presence of public power in the region and combat environmental crime together with other associated illicit activities; and (3) sustainable productive chains, which aims to increase the productivity of areas that have already been deforested and promote economic options that coexist with the forest and biodiversity, generating products with high added value from raw materials that are properly extracted from or produced in the forest.

Among the hundreds of activities carried out within the scope of PPCDAm, one can mention the demarcation of 10 million hectares of indigenous land, the creation of 50 million hectares of protected areas, the building of state capacity in federal environmental agencies, the administrative accountability of buyers and financiers of products produced in embargoed areas, restricting public credit for companies that operate, finance or buy from embargoed areas, opening new lines of credit for family farmers and small producers, offering direct subsidies for the commercialization of extractive products such as açaí, rubber, Brazil nuts and babassu through public purchases, structuring the Amazon Fund and increasing the volume of funds raised (Moulin 2023).

The PPCerrado, in its turn, began in 2010 and is now in the fourth phase. Its structure and axes are similar to those of the PPCDAm. However, while the Amazon has received more international and national visibility, is considered a national patrimony in the country's Constitution and continues to be more easily equated with the environmental agenda, the Cerrado inhabits the national imaginary as "Brazil's farm", a region with an alleged vocation to monoculture and already consolidated as an agribusiness frontier. Lobby from the agribusiness caucus has consistently prevented the inclusion of the Cerrado as a national patrimony in the Constitution. Geographically closer to the country's most populous cities, the Cerrado has served as a leakage region and a "sacrifice zone" for conservation actions in the Amazon.

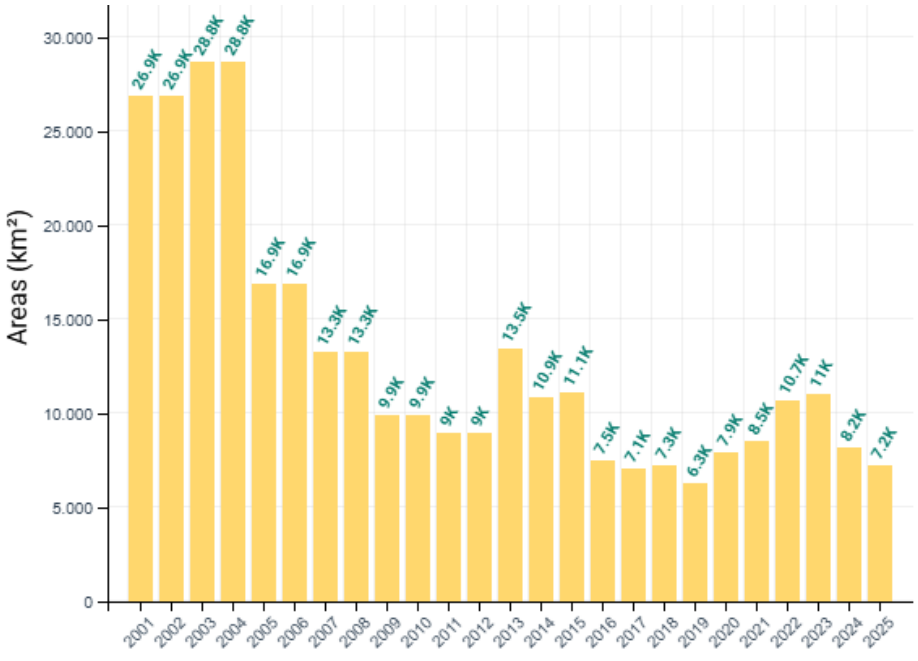
This situation is compounded by two factors: discrepancies in environmental obligations posited in infra-constitutional law and differences in land structure. According to the Forest Code, rural properties located in the Amazon must conserve at least 80% of its area with native vegetation, while in the Cerrado this percentage drops to 20%. Moreover, the Amazon has around 57 million hectares of undesignated public forests, mostly under federal jurisdiction (Moutinho *et al.* 2022). The Cerrado, on the other hand, has fewer protected areas and more private areas. When they do exist, undesignated lands are largely under subnational jurisdiction. In Brazilian law, subnational state agencies are responsible for environmental licensing and inspection on private properties. Therefore, while in the Amazon the Union enjoys wide policy protagonism, in the Cerrado the subnational states must be brought to the scene.

GRAPHIC 1



Graphic 1. Deforestation rates in the Brazilian Amazon 1988-2025 (km2/year). (Source: https://terrabrasilis.dpi.inpe.br/app/dashboard/deforestation/biomes/legal_amazon/rates)

GRAPHIC 2



Graphic 2: Deforestation rates in the Brazilian Cerrado 2001-2025 (km2/year). (Source: https://terrabrasilis.dpi.inpe.br/app/dashboard/deforestation/biomes/cerrado/increments)

3. Results and discussion

This section presents and discusses the main regularities, repetitions, and patterns identified in the interviewees' answers regarding anti-deforestation policies and, in the

case of the farmers, also the values and beliefs associated with their identity and function within the cattle or soy global value chain. We noticed that farmers were less outspoken about command and control instruments such as inspection operations, possibly because they did not want to convey the impression of being lawbreakers or environmental offenders. On the other hand, the market-oriented topic of traceability was addressed more openly and commented on by many of the interviewees. Therefore, below we narrow down the discussion by clustering it into two main themes: (1) traceability, both from the prosecutors' and the farmers' perspectives; and, solely from the farmers' point of view, (2) the imbrication between identity and division of labor within the supply chain.

3.1. Traceability

Prosecutors have very peculiar attributions in Brazil: besides playing the traditional role of investigator and accuser in criminal cases, they also have the mandate to defend, in judicial courts and by extrajudicial means, the collective interests of society. In the 2000s, the Federal Public Prosecutor's Office signed an agreement with more than 70 slaughterhouses and 60 soy companies. The cattle agreements started in 2009 and the soy agreement, inspired by the previous Soy Moratorium (a voluntary private agreement undertaken by soy processors) but broader in geographical and material scope, started in 2014. At the beginning, the agreements targeted only the plants based in the Amazon. In a second moment, they started to be expanded to encompass plants based in the Cerrado too.

The agreements have slightly different requirements, but in general both oblige the companies to stop buying from suppliers that are involved with illegal deforestation, forced labor, land grabbing or land conflict, that overlap with indigenous or traditional lands, or that have negative impacts on indigenous or traditional communities. Identifying each of these rights violations depends on legal recognition by different judicial or administrative authorities. To identify illegal deforestation for purposes of the agreement, for instance, one must look at the embargo lists issued by Brazil's environmental agency (Ibama) and at satellite data published by the National Institute of Space Research (Inpe). The data set to identify forced labor is a dirty-list elaborated by the Ministry of Labor. Land grabbing or land violence, according to the agreement's wording, requires a judicial conviction at least in first trial. Overlapping with indigenous or traditional lands can be attested by Brazil's land and indigenous agencies (Incra and Funai). Negative impact on these communities needs to be first recognized by the prosecutor's office in an administrative proceeding, provided that all affected parties have due right to respond.

The agreements were conceived with a very comprehensive design, but inspecting all the requirements has proved to be a challenge. Monitoring is mostly done by auditors privately hired by the companies; reports are in a second moment evaluated by the prosecutors, who readily admit they do not have expertise to do the monitoring by themselves. Traders and slaughterhouses often have hundreds of thousands of suppliers, and the input channels to monitor most requirements have not been streamlined yet. For instance, there is no national list of convicted individuals for land grabbing or land violence—neither the prosecutors nor the audit companies have appropriate tools to run this check on a periodic and large-scale basis. The requirement

that ends up being more effectively monitored is the prohibition of illegal deforestation, which historically has received more visibility. What many institutions have done is to use deforestation as a proxy, a signal, of other violations. Where there is illegal deforestation, there is probably also land grabbing; deforestation inside indigenous or traditional lands by default also causes negative impacts on the communities, and so forth. This approach was far from ideal, but it was pragmatic and worked partially.

Monitoring requires traceability at farm-level, so that traders and slaughterhouses can effectively block non-compliant suppliers. Without some kind of traceability, it would not be possible to know whether a product actually came from areas in disconformity with the requirements. Besides being core to the implementation of an agreement proposed by a national authority (the Public Prosecutor's Office), traceability has been increasingly demanded by the European Union, an important market for Brazilian soy and beef. On June 29, 2023, the European Regulation 2023/1115 on deforestation-free products came into force, which obliges individuals or companies operating in the European market to prove that commodities were not produced on land subject to legal or illegal deforestation after December 31, 2020. The Corporate Sustainability Due Diligence Directive (CSDDD), which entered into force on 25 July 2024, also depends on the possibility of traceability. The directive aims to establish rules on companies' responsibility towards human rights and the obligation to carry out due diligence in their corporate actions. Other EU member states, such as France and Germany, have already adopted national due diligence laws applicable to supply chains that include environmental obligations and count on traceability at farm-level. On July 1, 2023, the Chinese trader COFCO announced a voluntary commitment to achieve complete traceability of soybeans purchased directly from producers throughout Brazil.

Therefore, given the centrality of traceability to the monitoring process of both the domestic agreements and international initiatives, interviewees were asked about the topic. We coded the interviews by clustering the fragments that conveyed patterns of meaning, repeated or similar arguments and opinions. It is important to highlight that the interviewees' frames of thought are not necessarily true; they are constructions shared by groups of actors. Yet, to the extent that they influence in a very strong way how the actors orient their behavior, these perceptions and assumptions remain key objects of investigation.

3.2. The prosecutors' view

Starting with the prosecutors' view, the first aspect shared by this group was a conviction that traceability is the only solution to reduce fraud in the agreements. As the audit reports (Amigos da Terra 2021, 16), scientific articles (Rajão *et al.* 2020) and civil society (Barreto and Gibbs 2015, Global Witness and Imazon 2020) have shown, the main bottleneck is the indirect suppliers, which are not monitored yet by the slaughterhouses' methodology. Triangulation and laundering started to emerge: embargoed farms launder irregular cattle through clean farms. This is possible because the current system is mostly paper-based. GPS-based traceability, according to the prosecutors, is technologically possible and economically viable, and would be the only remedy against this type of fraud.

Although the prosecutors have evidence of triangulation and laundering, they opted not to enforce the breached agreements in court. Their main argument is that the economic impact on partner companies must be taken into consideration. As one prosecutor put it, if the slaughterhouses comply with the agreement to the letter, they will bankrupt, meaning that the financial feasibility of the meat industry still depends on cattle of irregular origin. If the industry goes bankrupt, the cattle will go to clandestine slaughter or to slaughterhouses that did not sign the agreement, a worse outcome in comparison. At some point they will pressure the indirect suppliers, but, in the prosecutors' view, now it is still not the best moment.

Another major hindrance to the adoption of more modern techniques, such as GPS earrings, is that Brazilian ranchers have a certain trauma. They associate traceability automatically with a negative experience with a health-oriented tracking system implemented by the Brazilian government in the 2000s, in the wake of the mad cow outbreak. This system is compulsory for producers who operate in the European market. It basically transmits two information: property of origin and vaccinations. This system increased production costs by 10% to 15% and did not result in additional gains to the producers.

Another feature highlighted by the prosecutors is that individual traceability and farm-level embargos are more efficacious to protect human rights in the long-term than large-scale territorial embargos (or "responsible disengagement," in the language of the CSDDD). If buyers with higher standards simply stop buying from an entire region such as the Amazon or the Cerrado, the primary effect will be to push local producers to buyers with lower standards. Prosecutors also emphasized the need to have other countries on board to reduce spillover and leakage. Specially China, the Middle East and the Brazilian domestic market, which are the three main destinations of the meat produced in the Amazon and Cerrado. To the prosecutors, the main threat to human rights and the environment today is not posed by the giant meatpackers, so often named and shamed in public opinion, but actually by the slaughterhouses that did not sign any agreement and are not in dialogue with the prosecutor's office.

3.3. The farmers' and ranchers' view

The main aspect voiced by the producers was that traceability is technologically possible but not economically attractive because, in their experience, its implementation costs are borne exclusively by the producer. Slaughterhouses, traders and retailers do not remunerate them accordingly, as the above-mentioned episode with the health-oriented system would prove. They did not see political continuity in the initiative and those who adjusted and complied did not earn more for it. Another interesting argument against the compulsory nature of traceability was that its economic attractiveness from a producer's point of view lies precisely in market segmentation, not universalization. Traced cattle are worth more money because it is still a niche commodity. The day it becomes mandatory, it will not bring any advantage to the producer.

Another point repeatedly brought by the ranchers was a clear notion that triangulation and laundering never resulted in true sanctions. This perception of impunity discourages compliance with more expensive traceability devices. If those who profit from being at the margins of the law do not suffer any consequences, those who strive

to obey it will remain at disadvantage. Lastly, they also made the well-known contention that traceability is an imposition by the European Union and an attack on national sovereignty, neo-protectionism disguised as humanitarian concerns. They also claim that the current system already provides the consumer with all relevant information that they need to know. Property of origin and vaccinations are the only data that should matter for consumers: everything that goes beyond that is excess of information. Ranchers who expressed this more contesting view sought to transmit the message they will resist GPS traceability.

Turning now to the soy chain, the most frequently raised argument was similar to that brought by the ranchers': farmers have the means to do traceability but the buyers (mainly transnational retailers) do not want to pay more for it. Another point is that, as a result of the pressure by the European Union on the traditional traders, Brazilian soy associations started to sell directly to non-European countries like Saudi Arabia and Egypt, or even to non-central European countries like Malta, "bypassing" the traders. These buyers intensified their purchases of Brazilian soy with the purpose of industrializing it and selling it in the European market.

One respondent contested the legitimacy of European due diligence laws using a more sophisticated argument than the attack on national sovereignty. He questioned what he sees as a certain selectiveness in the enforcement of due diligence laws. He is unaware of similar pressure on US soy producers, which lightens up the suspicion that prioritization is geopolitically biased. Human right violations and environmental damages occur in many countries; why would Brazil be a preferred target? The only logical answer, in his view, is that deep down these laws still are non-tariff barriers against the Brazilian agribusiness to favor either European local farmers or geopolitical allies like the US, which is the world's second largest soy producer and a direct competitor to Brazilian soy.

Despite his contempt for selective enforcement, the respondent admitted that farmers prefer to do business with traders rather than to sell directly to the countries for predictability reasons. Traders lock the price and offer a guarantee of purchase, while countries can walk out of the deals more easily, in which cases the association must push the product in the common market for a lower price.

3.4. Identity and labor division within the chain

Two cleavages related to the producers' self-identity emerged quite clearly in the interviews. The first concerns a perceived abyssal difference between agriculture and livestock production. Most of the cattle ranchers spoke of agricultural enterprises in an admiring, aspirational tone, as if cattle ranching symbolized the past and monocrop plantations, a distant future—in the words of an interviewee, "a dream." Soy farming is positively associated with high technology, staggering productivity, and stable profitability, while cattle raising is seen as a remnant of the "pioneers' era", a residual economic activity that will end up restricted to areas of hilly topography, unsuitable for agriculture. Many ranchers expressed the desire to transition to agriculture, motivated by the volatility of the cattle price on the domestic and international market (it follows a triannual cycle based on the number of nursing cows available in each region), combined with the loss of soil quality and deterioration of climate conditions in areas of

consolidated frontier due to inconsequential practices applied in extensive ranching. Yet, the transition would not be so easy, as it requires the acquisition of specialized knowledge and expensive technology packages.

It is the second identitarian boundary that emerged in the interviewees' answers, though, that speaks more directly to the "subjective dispositions" underlying Brazil's re-primarization and the predominance of an agrarian ethos among the national elite. Almost all interviewees manifested the existence of a chiasm between the first chain tier (primary producers, be they ranchers or farmers) and the second chain tier (processing industries, be they meatpackers or soy traders/crushers). There is, evidently, a direct distributive conflict between the tiers, as the literature on supply chain relationships has long pointed out and theorized. The farmer wants to sell for the highest price possible; the industry wants to buy for the lowest. They are, in the lively description of a rancher, like "two wolves looking at each other," which "cannot eat each other, but are not friends either." There are, however, other aspects implicated in the perception that farmers have of industries.

One aspect repeatedly brought up by the farmers is the belief that the second tier of the soy and cattle chains has oligopsonic traits. Moreover, industries have much more knowledge about the farms' businesses than the other way around: information asymmetry operates in favor of the second tier. If the rancher waits too long to sell a herd trying to get better commercial conditions, they expose themselves to substantial price depreciation. Without coordinated action from the ranchers, for instance through the local rural union, the industries are able to set the tone for negotiations with the farmers individually. In an attempt to avoid feeling trapped by the biggest slaughterhouses, when possible ranchers opt for local plants. Transnational meatpackers are seen as mechanical, rigid, impersonal and opaque, as their ownership changes constantly and no familiar face or name can be attached to it. With local businesses, in turn, one can speak directly to the owner and it is easier to alter the negotiation. Two ranchers even spoke with nostalgia about the time they used to export live cattle and did not have to deal with meatpackers.

As for the soy chain, the answers provided by one respondent in particular are very illuminating of the current state of relations between farmers and traders in Brazil. Even though his opinion cannot be unreservedly generalized, he was the spokesperson of a large association of soy producers in Brazil. He strongly opposed the idea that industry is production. In his worldview, producers are those who own land, not those who manufacture the land's fruits. Besides denying the industry the identification that the agribusiness considers most honorable and claims for itself in the disputes over legitimacy and the distribution of costs and benefits in the public sphere, that of "producer," the respondent shared the strategy devised by the sector to bypass the impositions set by the traders: building their own warehouses and selling directly to the countries. The respondent also criticized Europe for its recent regulatory initiatives to restrict commodities contaminated with deforestation. In his view, as mentioned above, the only effect of these laws would be to benefit countries that are starting to emerge as intermediate soy processors. In a very self-assured tone, he mocked Europe for missing out on an opportunity to industrialize soy, losing jobs and tax revenue.

At this point in the interview, we wondered why he could not apply that same rationale to his own country. Here, we should remind that most of the soy produced in Brazil (60.7%) is exported in natura (52.2% is exported as oil and 26.1% as meal) (Embrapa).[1] In the beef chain, the proportion exported as a raw commodity is even higher. In 2023, 85.70% was exported in natura and 8.85% was exported with some level of processing (Abiec 2021). As the main destination for Brazilian soybeans is animal feed, both chains are strongly linked to the global supply of protein.

With these numbers in mind, we asked him if the association did not have any interest in processing soy. After all, the association already has the storage; the 2020/2022 harvests have yielded extraordinary profits; the step would not be risky not intensive in technology. It could create more stable jobs and generate revenue locally, contributing to the retention of value in Brazilian territory. One study estimated that oil soy results in three times as many jobs and twice as much GDP for the producing country (Medina *et al.* 2016). Moreover, industrialization would redirect surplus capital from horizontal expansion toward vertical value-adding, reducing deforestation. Surprisingly, his answer was not directly grounded on "economic" factors but on identity issues:

> We're farmers, we're not industrialists. We each do our own thing. I can't own a tire company and a fuel company. Either I do one or the other. If you try to do more than one thing, you'll make mistakes. We're just grain producers; we're going to sell the grain. [...] Industrial capacity lies with someone who has the aptitude for it, not us. We're just going to standardize the grain and sell the grain. (Interview with representative of soy producers' association)

In the respondent's mindset, apparently Egypt and Saudi Arabia, countries with no tradition in soy production, and Malta, a small island with very little farmland (compared to Brazil) have more aptitude to process soy than one of the world's largest association of soy producers. The short-sightedness, extreme risk-averseness, absence of industrial aptitude and lack of vision—all facets of the rentist side of Brazil's landowning elites—is a persistent obstacle to reversing the deterioration in the terms-of-trade that disadvantages producers of raw commodities.

4. Conclusions

Traceability at farm-level is technologically possible; its large-scale adoption depends on the readiness of slaughterhouses and supermarkets to share its costs and on pressure by public authorities and civil society. Higher standards are already triggering market segmentation and leakage in the Amazon and Cerrado regions. The catch-up is not automatic; it also requires political pressure. Europe, China, the Middle East, and Brazilian consumers also need to be willing to pay the price for traceability.

A new phenomenon is the emergence of intermediary soy processors: non-EU countries are seizing the opportunity to profit from the commercial standoff between traders and producers. A measure that could improve the monitoring of the cattle agreements would be to integrate the current paper-based, health-oriented traceability system with more up-to-date technologies to monitor the requirements already designed in the prosecutors' agreements.

[1] See: https://www.embrapa.br/soja/cultivos/soja1/dados-economicos

Soy and cattle supply chains are archetypically "buyer-driven": processors and traders exert superior bargaining power over primary producers, which breeds resentment and mistrust on the part of the later toward the former. Despite the widespread view that industry profits disproportionately and at their expenses, the farmers interviewed showed little interest in channeling surplus into building processing plants and joining the industrial club. Thus, preventing negative environmental and social impacts while generating income also requires reverting the deterioration in the terms-of-trade: the short-sightedness of Brazilian landowners who are disinterested in industry remains a major obstacle.

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