

# Why has the Brazilian Cerrado been left behind by voluntary environmental policies?

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## ABSTRACT

The expansion of soy production has been a deforestation driver in Brazil in both the Amazon and the highly biodiverse Cerrado savannah ecosystem. To tackle this problem the soy industry implemented a sector-wide zero-deforestation policy in 2006 in the Amazon called the Soy Moratorium. The Soy Moratorium sharply reduced the soy-driven deforestation in the Amazon. However, to date, despite substantial soy deforestation, the neighbouring Cerrado remains unprotected. Here we ask why no comparable zero-deforestation agreement was implemented in the Cerrado. To answer this question, we integrated theory on policy adoption and selection from the voluntary environmental policy literature with theory on policy process and feasibility from public policy, political economy, and organizational theory. This expanded framework enabled us to better understand how historical, political and geographical contextual factors shaped the differing policy adoption outcomes in the Amazon and Cerrado. We then conducted 26 in-depth interviews, including with key private sector decision-makers on policy adoption to understand the relative importance of different potential factors. We found that the differences in public awareness, national politics and narratives, changes in trade relationships, leadership and sunk investments influenced why an agreement emerged in the Amazon and not the Cerrado. Despite these circumstances, a new political window for Cerrado conservation policies has recently emerged with Brazil's political shifts to a left-centre coalition and efforts to extend new due-diligence deforestation regulations to other wooded lands, including the Cerrado.

## 1. Introduction

Since 2000, commodity-driven agricultural expansion has been responsible for approximately 30 % of global forest disturbance, with soy, palm oil, cattle, and cocoa being the main deforestation drivers in tropical regions (Curtis et al., 2018; Hosonuma et al., 2012). Brazil has the largest tropical forest and has experienced the highest forest losses and degradation in absolute numbers, with 59.8 million hectares of tree cover lost from 2001 to 2020 (Global Forest Watch, 2021), mainly in the Cerrado and Amazon biomes. The Cerrado savannah comprises forest and non-forest characteristics, and the latter is not often captured by deforestation monitoring systems or protected by conservation policies. Nevertheless, the non-forest conversion already represents 11 % of the total native vegetation clearing (Mapbiomas, 2023) and the trend in the Cerrado deforestation has increased over the past three years, reaching 10,689 km<sup>2</sup>, close to the 12,481 km<sup>2</sup> of forests cleared in the Amazon

(INPE - Instituto Nacional de Pesquisas Espaciais, 2023a, 2023b). Despite providing crucial ecosystem services and being the home of traditional communities and indigenous people, these biomes continue to be cleared at alarming rates (Favareto et al., 2019; Sawyer, 2017; Strassburg et al., 2017). Historically, policies and investments in the Cerrado have focused on agricultural expansion, which is partially explained by its land availability and agronomic suitability (flat, well-drained soils) for large-scale mechanized agriculture (Hecht, 2005; Russo Lopes et al., 2021; Sauer and Pereira Leite, 2012). Large-scale agricultural expansion has benefited aggregated human development outcomes (e.g., income, life expectancy, and educational attainment) in some regions, but has increased inequality (Garrett and Rausch, 2015) and led the displacement of local communities, reducing and constraining their social capabilities and access to resources due to regional changes (Eloy et al., 2016; Levy et al., 2024; Oliveira and Hecht, 2016; Russo Lopes et al., 2021).

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Until the early 2000s, soybean production was one of the largest drivers of deforestation in the Cerrado and a rising driver of Amazonian deforestation. However, civil society, led by Greenpeace, pressure on soy companies in the Amazon resulted in the major soy industry groups, the Brazilian Association of Vegetable Oil Industries (ABIOVE – Portuguese acronym) and National Grain Exporters Association (ANEC – Portuguese acronym) (ABIOVE, 2006), committing to the Soy Moratorium (SoyM) in 2006. This is a voluntary agreement not to purchase soy grown on land deforested after July 2006 (ABIOVE, 2006), later modified to July 2008 to align with the amnesty for historical deforestation provided by the revised national forest policy (i.e., the Forest Code). By most accounts, the SoyM was a large success and critical to overall deforestation reductions in the Amazon (Nepstad et al., 2014). Estimates suggest the SoyM helped reduce deforestation for soy in the Amazon by 2,304 to 18,000 km<sup>2</sup> during its first decade (2006–2016), representing a 50 % reduction in soy-driven deforestation in soy-suitable areas (Gollnow et al., 2022; Heilmayr et al., 2020). Its success was aided by complementary public policy improvements at the time, including the government's Action Plan for the Prevention and Control of Deforestation in the Legal Amazon (PPCDAm – Portuguese acronym) (Garrett et al., 2019; Gibbs et al., 2015; Nepstad et al., 2014).

Noting this success, conservation actors and scientists have advocated for a SoyM-like agreement in the Brazilian Cerrado. Various studies have justified these calls by examining how much deforestation could have been avoided with such an agreement (Garrett et al., 2022; Gollnow et al., 2022; Soterroni et al., 2019). Gollnow et al. (2022), for example, estimated that if companies' global zero deforestation commitments had been implemented in the Cerrado biome, 46 % of direct soy-deforestation in this region would have been avoided. Furthermore, studies have indicated that the implementation of more stringent conservation policies in the Cerrado could have positive spillovers, such as stimulating intensification in existing cattle and soybean areas (Garrett et al., 2018; Nepstad et al., 2019). Yet to date, no SoyM has been adopted in the Cerrado. Instead, the Cerrado has directly suffered as a result of its lack of protections relative to the Amazon (Garrett et al., 2019; Gollnow et al., 2018; Villoria et al., 2022), whereby deforestation is any conversion from native vegetation to anthropogenic land use. Estimates show that 16.4 % of the deforestation avoided in the Amazon has been displaced to the Cerrado (Villoria et al., 2022). Various actors have implemented pilot programs to pay soy farmers not to deforest legally clearable areas (a form of payment for environmental services). Yet these pilots have not been extended further.

This situation gives rise to two questions: Why haven't any stringent voluntary environmental policies (VEPs) for soy been implemented in the Brazilian Cerrado despite the larger threats of soy deforestation in this region? What is the likelihood that such a policy may be adopted in the coming years? To answer these questions, we first developed a theoretical framework guiding our understanding of the potential factors influencing the emergence of VEPs in the agri-food sector drawing heavily on Peng et al. (2021) and Rueda et al. (2017). We advance these frameworks using policy process and feasibility theory from the fields of public policy, political economy, and organizational theory.

## 2. A framework for understanding VEP feasibility

Rueda et al. (2017) established a first framework for understanding the adoption of voluntary sustainability commitments in the agri-food sector with a focus on what drives the adoption of policies with different levels of environmental stringency. In their model, the three main categories of factors influencing adoption were i) the degree of environmental pressures and opportunities in the places where the company's raw materials are coming from; ii) the company's own leverage in the supply chain; and iii) their market risks and opportunities from action/inaction. This framework posits that more stringent environmental policies will be adopted where environmental risks and public awareness of those risks (especially the company's role in them)

are high and there are no other options to control these risks beyond restricting the activity. The framework has since been applied to bigger empirical studies to analyze the adoption of sustainability commitments for coffee (Bager et al., 2020) and soy (Gollnow et al., 2022), evaluating 546 companies. Yet these studies bias towards areas where sustainability instruments already exist or focus on global policy adoption, rather than region-supply chain-specific approaches. To the best of our knowledge, no studies have used this theory to understand why policies have *not* been adopted and implemented in a particular region or sector. For this reason, it is useful to look at the broader literature on policy adoption from political economy, public environmental policy, and organizational theory to better understand the paradox of low policy adoption in the Brazilian Cerrado soy sector.

Political economy theories of policy adoption and feasibility focus on the importance of public opinion (Kolcava et al., 2023), government capacity (Kolcava et al., 2023; Peng et al., 2021), and market structure (Caporaso, 2005; Garrett et al., 2013a; Peng et al., 2021) to create the conditions for policy emergence. Although public opinion may vary over time, conceptually it relies on the public's preferences on a given issue. Similarly, within policy process theory, the Advocacy Coalition Framework (ACF), emphasizes the importance of public opinion, information on the seriousness of the problem and alternatives, and public campaigns in driving support for different policies (Sabatier and Weible, 2007). Thus, the feasibility of adopting new environmental regulations also depends on the degree to which sustainability is valued by society above other objectives and public awareness about sustainability issues. Public preferences have also been indicated as important for VEP adoption. Where preferences for environmental protection are strong, firms have increased incentives to adopt VEPs that go beyond compliance due to the presence of potential marketing advantages (Khanna et al., 2010).

The issue of public opinion relates back to the first category in the Rueda et al., (2017) framework – the presence of high environmental pressures and opportunities. The degree to which environmental pressures and opportunities are perceived and become a concern relevant to policymakers is a function of the public's awareness of a particular issue and the degree of concern ascribed to a given sustainability challenge. In the context of VEPs that focus on tropical agri-food commodities, it is of particular relevance that biases towards specific types of conservation have already been documented (Kolcava et al., 2023). These studies emphasize that while high environmental risks occur in many biomes, the public has exhibited increased concern and motivation to protect tropical forests versus the conservation of tropical dryland forests and savannas. Differences in public concern for the Amazon versus Cerrado are thus a relevant factor for the lack of any large-scale VEP adoption in the Cerrado.

The motivation and feasibility of public sector actors to adopt a particular policy is also a function of its regulatory and financial capacities, which provide the mechanisms, credibility, and viability for the private sector to opt in to more stringent VEPs (Mangonnet et al., 2022, Sabatier & Weible, 2007). While a lack of government institutional capacity is often the justification for VEPs, it can also constrain the operational capacity to opt in (Garrett et al., 2019; Kolcava et al., 2023). Thus previous work has hypothesized that VEPs are most likely to be adopted when complementary public policies exist (Furumo and Lambin, 2021; Lambin and Thorlakson, 2018), such as national and sub-national coordination on land use and conservation regulatory framework, which is therefore backed up by law enforcement and penalties. This also relates back to a hypothesis by Rueda et al., (2017) that suppliers must have sufficient leverage over their suppliers to enact more stringent policies. The SoyM is a market exclusion mechanism, one of the most stringent types of VEP (Garrett et al., 2019). It requires excellent supply chain traceability and property-level deforestation monitoring. Thus it may not be possible where the public governance context creates insufficient transparency of market transactions, land ownership, or land monitoring capacities (Garrett et al., 2019; Kolcava

et al., 2023).

The political power structures also influence decision-makers in both the public and private sectors. As posited by Rueda et al., (2017), where companies lack sufficient power to influence suppliers' behaviors due to a lack of vertical integration or market consolidation, for example, they will be less likely to adopt VEPs. However, it's also necessary to look at power relations outside of the supply chain, such as importers' countries or investors that could potentially demand traceable and zero deforestation products. Work from political economy suggests that when a new policy threatens the interests of a powerful group in the government it is less likely to be adopted (Peng et al., 2021). Hence the environmental agenda in local and national politics also suggests how companies lean towards adopting VEP. The power and authority of different advocacy coalitions is also a core theme in the ACF literature (Sabatier and Weible, 2007).

Political economy and VEP theories also posit that policies are less likely to be supported/adopted when their adoption severely impacts the profitability of powerful actors/companies (Peng et al., 2021) (i.e. where the opportunity costs of VEP adoption are too high) and/or threatens the interests of lawmakers, which is often the case in areas where electoral campaigns are financed by industry actors. Consequently, in the context of differential policy adoption in the Amazon versus Cerrado it is worthwhile to examine how different the political contexts and financial costs of adoption are perceived by policymakers between the two biomes. When low-cost behavior changes are not possible as a result of the policy, both policy resistance and leakage can be expected (Rueda et al., 2017). The costs of policy adoption include not only the direct costs to the industry of verifying compliance, but also the opportunity cost. That is the cost of not being able to do the activity at all in a place where there has already been some initial investment. Actors may even be more likely to band together to oppose policies when they believe it is likely to impose very high costs (Sotirov and Memmler, 2012).

The importance of leadership for environmental policy adoption is rarely discussed in the VEP literature, but is prominent within the ACF framework and includes understanding the ability of strategically skilled actors to negotiate agreements and put in place credible implementation, within and outside their field of domain (Fligstein and McAdam, 2011), to sway opinions and build consensus (Prakash, 2001), form political coalitions around powerful actors (Fligstein and McAdam, 2011), and to model desired behaviors. It is a form of "soft power" (Prakash, 2001). The leadership literature is extensive in typifying leaders and seeks to understand whether types of leaders lead to sustainable achievements (Du et al., 2013). One study within the domain of VEPs by Prakash (2001) suggests that given the need to generate support for activities that may run counter to immediate profit motives and go beyond legal compliance, the persuasion to pro-environmental policy adoption must come from someone quite high up in the relevant organizations (Steg, 2016).

The literature review on pro-environmental behaviour in organisations highlights that the values of the main negotiators and leaders are also key to mobilize policy change. The perceived importance and evaluations of various behavioural consequences depend on which values people prioritize (Steg, 2016). According to the review, four categories of values are helpful to understanding leaders' pro-environmental behaviour i) the hedonic value is when people focus on what makes them feel good and reduces their efforts; ii) the egoistic value is when people focus on increasing their resources and status; iii) the altruistic value is when people focus on benefiting others, and iv) biospheric values is when people focus in the consequences of the behavior for the environment. Hence, people are more likely to act on their biospheric values when they are activated and when the relevant choice context supports these values (Steg, 2016). In the context of the SoyM the individual personalities and capacities of the actors in both the soy industry and environmental NGO were likely highly relevant to pro-environmental policy adoption choices.

In sum, we can understand private sector VEP choices across different regions as a function of i) **public opinion** in the audience/groups that companies are marketing their products to, which influences the marketing benefits and reputational risks of VEP adoption/non-adoption; ii) the **policy context and capacities**, which influence which types of policies are economically and political feasible; iii) **company power** relative to producers and consumers, which influences the sourcing and marketing risks of VEP adoption/non-adoption; iv) the **financial costs** associated with VEP adoption/non-adoption; and iv) the presence of **persuasive leaders** driven by values that activate pro-environmental behaviours and persuade others of their choices' (i.e. "changemakers") (Table 1). All of these factors may come together during particular policy windows (Furumo and Lambin, 2021), making **timing** a final essential element of VEP adoption, as with any policy. As described in (Furumo and Lambin, 2021), a policy window occurs when a **problem stream**, consisting of a collective awareness-focusing event, converges with a **political stream**, favorable national political sentiment and discourse, and a **policy stream**, sufficient capacity (i.e., political, institutional) for a plausible policy alternative. Political factors, in particular, can change greatly over time leading to policy windows opening and closing (Brunner, 2008).

### 3. Methods

We used the above framework to develop a questionnaire (see SI) to guide semi-structured interviews with people who directly participated in the SoyM and the Cerrado Agreement decision-making processes. Indirect agents were also interviewed since they performed important roles as opinion-makers (Table S2). The interviewees were identified according to the organizations that were active in GTS (Soy Moratorium Working Group - Portuguese acronym) and GTC (Cerrado Working Group - Portuguese acronym), guaranteeing that decision makers were interviewed, plus an additional snowball sampling for indirect agents. The interviews included i) the private sector actors, including members of soy industry companies and associations, producers, and specialists/consultants, ii) civil society organizations, iii) researchers, and iv) representatives from the federal government. In total, we conducted 26 in-depth semi-structured interviews, 15 out of 26 from the private sector, 8 from civil society, 2 researchers, and 1 from the federal government. We also analyzed documents from both SoyM and GTC, such as reports, internal meeting notes, documents produced as part of the decision-making processes, and external press releases. The authors also joined thematic soy supply chain webinars and external events.

Interviewees were invited via e-mail and/or WhatsApp, attached with a one-page explanation of the research and the informed consent, approved by the Brazilian Ethical Commission [Protocol number 56065821.0.0000.8124] and ETH Ethical Committee. The interviews were in Portuguese by the first author who is a native Brazilian Portuguese speaker. The interviews were recorded, subject to the interviewees' permission and transcribed using the software "Trint." When permission was not given notes were taken throughout the interview. Quotes included below are translations from Portuguese, partially paraphrased when the Portuguese doesn't translate directly to English.

The interviews were used in deductive analysis, that is, to explore the level of evidence for different factors within theoretical framework. The framework thus served as a guide for the broad questions (see SI for questionnaire) and to help order and analyze the responses. The main topics that people were asked about were: i) the SoyM and GTC historical process, including their participation in policy design and emergence; ii) national political, institutional, and economic factors enabling and/or constraining policy emergence; iii) decision-making processes and agent roles; iv) the governance structures & political power; and v) the international context of the soy market. While the deductive approach may somewhat constrain our ability to think about new factors outside the framework, the open-ended nature of the questions allowed

**Table 1**  
Factors and criteria for voluntary environmental policy emergence.

Factors	Criteria	References
1. Public opinion in market-linked groups	There must be a high level of public concern about the environmental issue in markets linked to the companies in question, which poses potential reputational risks for the company if the concern is not addressed. Conversely, when there is potential for marketing differentiation and for increasing market share, companies and sectors are more likely to adopt and implement VEPs.	(Rueda et al., 2017; Kolcava et al., 2023; Khanna et al., 2010; Oliveira and Hecht, 2016)
2. Policy and political context	A conducive political governance provides institutional capacity and safeguards for VEP implementation. This includes the degree of compatibility between the existing laws in a region as well as the political agenda of the governing administration with the goals of the voluntary environmental policy. This context also influences the opportunity costs of VEP implementation (e.g., by determining whether unsustainable behaviors are legal or not).	(Garrett et al., 2019; Peng et al., 2021; Pompeia, 2021a, 2021b)
3. Companies' power across the supply chain	For mid-stream industry groups and companies to adopt a VEP they must have less power than the downstream actors (e.g., retailers, consumers) pushing for environmental commitments, but more power than the upstream actors (e.g., producers) they are seeking to regulate. The absence of the former condition would reduce incentives to adopt VEPs, while the latter would create barriers to implementation. This factor is particularly dynamic and changes with political administrations, global market share and international demand for products under environmental conditions, assigning power directions within the supply chain.	(Rueda et al., 2017; Pompeia, 2021a, 2021b)
4. Financial costs	There must be sufficiently low sunk costs (upfront investments) associated with existing company behaviors and low opportunity costs (forgone profits) to adopting the VEP or else companies will choose to risk damages to their reputation and forgo marketing benefits or move their operations to new locations.	(Garrett et al., 2013a; Garrett et al., 2022; Caporaso, 2005)
5. Presence of persuasive leaders that value sustainability	The presence of powerful changemakers within the companies that push for pro-environmental attitudes and	(Fligstein and McAdam, 2011; Prakash, 2001; Koski and Lee, 2014;

**Table 1 (continued)**

Factors	Criteria	References
	interests, as well as powerful NGO leadership in the negotiation arena. Both sides agree on a shared view and promote its achievement	Mazutis and Zintel, 2015)

for different factors to inductively emerge that were not in the original framework. Responses were analysed manually. All of the responses that pertained to each factor were systematized using an Excel table, while also allowing new categories to emerge in the table. A table with illustrative quotes is presented in Table S3. The inductive element led to the following new categories being added to the framework during the process of analyzing the data: i) leadership, ii) the availability of land, and iii) the availability of traceability data. We followed up the interview analysis with primary documentation and media searches. This allowed us to trace the chronological facts better and validate agents' narratives.

We defined two periods of analysis, one from 2006 for SoyM and one from 2017 for the GTC Cerrado Agreement negotiation. Policy emergence feasibility factors were analyzed under three levels of likelihood: high, moderate, and low, and for each given score a set of evidence-based explanations is described (Data S1). Evidence was collected by primary and secondary data and when the evidence matched the criteria required for a higher policy likelihood emergence, the score given is high. When the criteria are partially reached the score is moderate, and if few criteria are met the feasibility for the policy emergence is low. These verification processes were then aggregated from the criteria level to the factor level to identify which overall factors had the most evidence (Data S1). In the following results section, we present the evidence for each political and economic factor that was collected and discuss how it affected the policy adoption (or lack thereof) in the Cerrado and the Amazon.

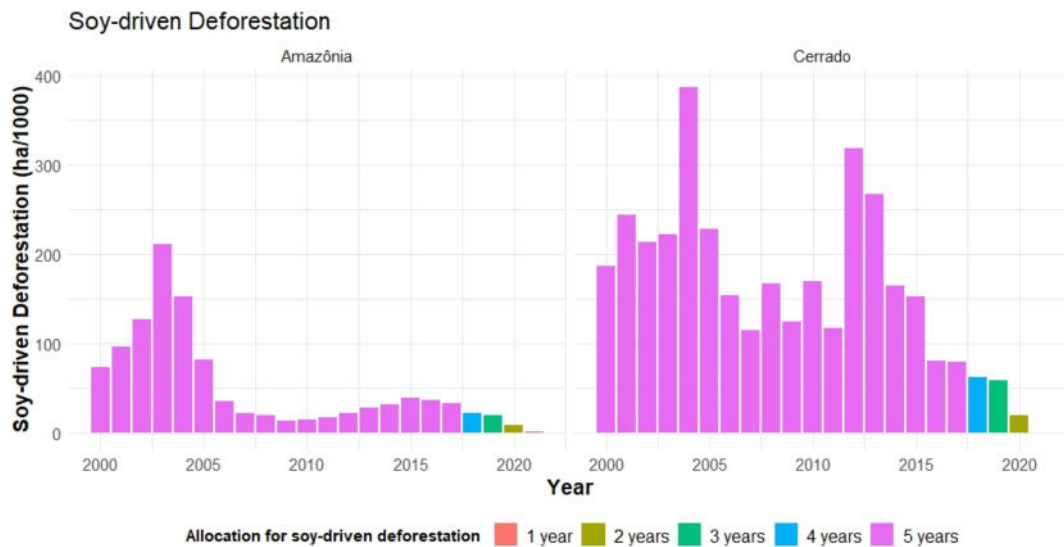
This approach enabled us to systematically examine the evidence for each potentially important factor. Although is not possible to disprove the importance of certain factors, we were able to establish a diverse evidence base for the importance of different key factors enabling/constraining the emergence of the targeted policies. Thus, the proposed analytical framework brings theoretical advancements that may inform other such cases into the political and economic feasibility policy design under sustainability private governance.

#### 4. Results

##### 4.1. A failure to launch: Stringent SoyM-like policies in the Cerrado were rejected and replaced by limited-scale financial incentives

The SoyM was adopted in the Amazon in 2006, but no similar policy was established in the Cerrado despite similar soy-deforestation rates. From 2000 to 2021 deforestation for soy in the Cerrado amounted to 3,531,879 ha – 3.2 times larger than soy-driven deforestation in the Amazon (Fig. 1). This is remarkable given the region's significantly smaller size. While soy-deforestation in the Amazon remained lower than the peak in 2003, it was high and variable in the Cerrado in subsequent years.

The ecological destruction in the Cerrado did not go unnoticed (Escobar et al., 2020; Manifesto do Cerrado [WWW Document], 2017; Russo Lopes et al., 2021; Strassburg et al., 2017). The accelerating rates of soy-driven deforestation in the Cerrado fueled discussions about the creation of the Cerrado Working Group -GTC comprised of industry actors, government officials, and Non-Governmental Organizations (NGOs) in 2017 Despite the initial public ambition to halt Cerrado deforestation, traders, NGOs, producers and local communities differed greatly in their positions about what types of protection they would



**Fig. 1.** Soy-driven deforestation in the Amazon and Cerrado as derived from Mapbiomas v8 (Mapbiomas, 2023). Deforestation is any conversion from native vegetation to anthropogenic land use. It becomes soy-driven deforestation if the deforested area is covered by soybean plantation in the following 5 years ( $t + 5$ ). The allocation year refers to the year of deforestation. For any year after 2017 the 5-year allocation period was shortened up to 2021. The downward trend is linked to the lower allocation period. More details on the methodology can be found in the SM of (Gollnow et al., 2022).

support within the Cerrado Agreement and related mechanisms. To some extent GTC's agenda-setting, plus the conflicts involving land natural resources access, such as water, between soy producers and local communities had reduced the participation of producers and social movements (Bastos Lima and Persson, 2020; Russo Lopes et al., 2021). Our interviews revealed that traders were against extending the Moratorium to the Cerrado, while NGOs pushed for a deforestation cut-off date like the SoyM from 2020. These contradictions plagued the Cerrado discussions since the beginning of the negotiations. Despite the high potential costs (Garrett et al., 2022), both sides instead agreed on the need for an economic compensation mechanism to facilitate the engagement of farmers' representatives in the Cerrado agreement.

Soybean producers were treated very differently within the Soy Moratorium Working Group and GTC. The producers were not asked to join the GTS, but companies demanded that they participate in the GTC, they even conditioned the existence of the GTC on this producer participation (SPS 01, SPS 03). Although some farmer's associations participated in the initial discussions, they did not last long. They left the GTC arguing against any policy that could limit soy expansion in the Cerrado, even if it wasn't the same as the Amazon SoyM.

Even with the polarized political scenario, the GTC designed a new Payment for Environmental Services mechanism combining financial compensation with an agreement to end the clearing surplus of native vegetation. The surplus is the percentage above what is legally entitled to be cleared when authorized by the Environmental State Agency, in soy production properties in the Cerrado. This was called the Cerrado Compensation Mechanism (CCM) and would be combined with the Cerrado Agreement cutoff date. Opposite to the SoyM market exclusion mechanism, the logic was that a financial payment would be given to producers as compensation for halting legal conversions (SPS 02). Producers holding an environmental license to deforest would be given an economic choice to not deforest. Otherwise, traders would apply a cutoff date and exclude producers that deforested Cerrado, either legally or illegally, after the cut-off date.

Meanwhile, civil society, upstream companies, and finance institutions signed "SOS Cerrado" Statement of support for the objectives of the Cerrado Manifesto [WWW Document], 2017 supporting the "Cerrado Manifesto" (Manifesto do Cerrado [WWW Document], 2017) in favor of a more stringent zero-deforestation policy. The SOS Cerrado was an attempt from the private sector to push the importance of

stopping the Cerrado deforestation. After the shift in the political regime in Brazil with the election of the far-right President Jair Bolsonaro, neither the CCM nor a stringent SoyM-like policy was adopted, and to the date of submission the Cerrado biome is still not covered by an effective sector-wise voluntary environmental policy.

#### 4.2. Public interest in Cerrado conservation was low and exacerbated by political commitments focused on the Amazon

Even though the Cerrado had comparable levels of deforestation in the last 20 years to the Amazon, which is proportionally higher since the Cerrado is nearly half of the Amazon (IBGE, 2019), the latter biome has been receiving much more attention from the science and media, which also influences public opinion, civil society efforts, and company attention. Companies and NGOs considered this bias when making policy decisions (SPS 06). "During the SoyM negotiation, the focus was on the Amazon, because of the European pressure. At that time nobody knew anything about the Cerrado" (SPS 03). As some civil society actors mentioned, Amazon was always Greenpeace's priority, reflecting their leadership among the civil society organization for the SoyM, and it manifested when the organization stepped back from the negotiations for the Cerrado Agreement (CSO 06, CSO 07). Which in turn had been led by another civil society organisation, the WWF. Without Greenpeace, the campaigns to push the global supply chain to adopt a stricter voluntary environmental policy were less successful, reinforcing Amazon's dominance over Cerrado in terms of public awareness for conservation.

Existing studies emphasize that this is linked to broader "high forest" biases (Hecht, 2005). That is, public preferences tend to favor the protection of humid tropical forests, motivated at least in part by the higher above-ground carbon stocks there (Pan et al., 2011). It is particularly important when scientists's focus drives the Amazon bias in media. "Around 2005/2006, climate change was repeatedly broadcast on the international news. As we could see on National Broadcast News, scientists were talking only about Amazon; they were pop stars, the Cerrado was being cleared but it was not the focus" (SC 01). This is evident in civil society campaigns by conservation organizations like Greenpeace and WWF in the early 2000s which had a focus on the Amazon and Borneo (Greenpeace, 2009, 2006; Hecht, 2005; Qin et al., 2022). Previous studies on the Roundtable on Responsible Soy have also

emphasized the importance of this high forest bias in influencing soy sustainability agreements (Garrett and Rausch, 2015; Steward, 2007).

Within Brazil, this is further institutionalized in the environmental regulatory frameworks, such as the “Forest Code” (Brasil, 2012), which applies more stringent conservation requirements in the Amazon than in other biomes. With some exceptions, Brazilian law requires that 80 % of private land in the Amazon Rainforest must be preserved by law, versus 35 to 20 % of native vegetation in the Cerrado. Moreover, the Protected Areas Program (ARPA) has had unequal levels of political commitment related to conserving the different biomes (Strassburg et al., 2017). Since its launch, ARPA has dedicated more resources to Amazon compared to others (WWF-Brazil and FUNBIO, 2017). In the Cerrado, however, since the 1980s agricultural expansion has been strategically promoted by national and local policies (Jepson et al., 2010). The Cerrado can be seen as a sacrifice zone for agricultural expansion, a place where narratives are framed around the need to give up on conservation goals because of the need to prioritize development and production (Levy, 2022; Oliveira and Hecht, 2016). This is particularly the case in a comparative sense; conservation is accepted in the Amazon, but the Cerrado is seen as too important for agriculture where deforestation is instead accepted. Recently, the European Union Deforestation Regulation, a policy that aims to achieve ‘deforestation-free’ products imported by EU countries to reduce the impact of global deforestation and forest degradation (Commission, 2024), has also prioritised forest in the policy design by not including other type of natural ecosystems in the policy (WWF-Brazil, 2024).

#### 4.3. Deforestation in the Amazon was seen as a major reputational risk due to connections to European markets

At the time of SoyM’s inception, 64 % of Brazilian soymeal exports and 38 % of the soybeans were destined for Europe. During that period, China imported 45 % of the Brazilian soybean (FAO, 2023). Greenpeace strategically read the market context, understanding the soy dynamics and its future possible expansion scenarios, the predominant export to Europe, and the powerful global value chain, characterized as modern agriculture, operated by a high-tech agent. With these attributes, Greenpeace was able to trace and attribute the deforestation to a global supply chain (SPS 03; CSO 06, SC 01). Interviewees noted that Greenpeace’s report “Eating up the Amazon” (Greenpeace, 2006) was important as it revealed that global soy supply chains did not trace their suppliers and were purchasing soy grown on deforested land (SPS 03; SPS 02; SPS 06; SPS 04). At this time, soy-driven deforestation in the Amazon was low, nevertheless, it captured international attention because of the land use modelling and the possible scenarios that could emerge from soy expansion there. “The Cerrado was always important to grain expansion, but we spent years only focused on the Amazon” (SC 01). “Actually, the big driver of Amazon deforestation, at that time of the SoyM, was the cattle” (SC 01, CSO 06).

The soy traders interviewed indicated that reputational risk was an important part of the equation for adopting the SoyM in 2006. The European market and the need to guarantee the development of new infrastructure to reduce the soybean transport costs to this region were seen as important for the soy sector. They didn’t want to risk losing that market due to civil society deforestation concerns about soy expansion in the Amazon (SPS 03, SPS 04, SPS 06). One major investment for the soy sector at the time was the construction of warehousing facilities by the company Cargill at the Santarém Port in Pará State near the confluence of the Tapajós and Amazon River. “It was crucial to transport the production through the north region, as planned by Cargill, and the association between deforestation and the new expansion could be a disaster for the business itself” (SPS 01; CSO 06).

Companies decided on a pre-competitive approach in the form of SoyM to level the playing field on sourcing from the Amazon. Or as one interviewee put it, it was seen as beneficial by the actors involved to have the power to establish the “offsides line” for soy-driven

deforestation, that is, the acceptable cut-off date (SPS 07). Conversely, by the time soy governance discussions in the Cerrado began to ramp up in 2017, China’s imports from Brazil had risen significantly, capturing 83 % of the soybean market share while the EU was reduced to only 6–9 % according to FAO, (2023) and Villoria et al., (2022). Even with the lower market power, importers from Europe pushed for the Cerrado agreement during GTC negotiations (SPS 01, SPS 02) and threatened boycotts of Brazilian products (SPS 01, SPS 02). Nevertheless, according to companies’ decision-makers, the soy Cerrado deforestation had not proven to be a reputational risk for the companies (SPS 01, SPS02, SPS 04, SPS 06, SC 01), corroborated by the unsuccessful boycott letters sent to ABIOVE. Those letters threatened to ban Brazilian soy imports if the sector didn’t set up an agreement to halt soy-driven deforestation in the Cerrado. In the end, they did not walk the talk and there was no boycott, giving space for greenwashing narratives (SPS 02).

NGOs and companies contradict each other on whether there was a clear number on how much money had to be in the fund to launch the CCM. NGOs emphasize that no minimum amount was set, while companies affirm the contrary (CSO1, CSO 02, CSO 03, CSO 07, SPS 01, SPS 02). Companies state that CCM’s fundraising did not reach the amount expected, which is also argued as a justification for leaving the negotiations (SPS 01, SPS 02, SPS 03, SPS 07, SPS 08, CSO 01). These economic and political shifts allowed companies to step back from their commitments to conservation in the Cerrado and reduce their domestic political risk (SPS 01, SPS 06, SPS 07).

#### 4.4. Companies’ land use data and their proficiency in using it to shape narratives influenced their risk calculations

Data availability emerged as an important part of the SoyM story, shaping other factors in the framework, in particular public opinion and perceived costs. At the time of SoyM, there were no detailed analyses available to companies, quantifying the amount of soy-driven deforestation occurring in the Amazon, especially not within individual supply chains. Soy companies’ lack of land use data meant that they were less able to counter Greenpeace’s arguments about the soy industry causing deforestation. “We made the SoyM because soy was accused of being the deforestation driver, but we didn’t have the data to confirm or deny it” (SPS 04, SPS 06). When the Cerrado agreement was negotiated, the industry was more equipped with land use mapping to discuss the relative importance of cattle versus soy in driving deforestation. “For the Cerrado, we know that (SPS 04, SPS 06) soy is not a deforestation driver, but the pressure on companies is the same. Even though reports about deforestation are sent to companies, nobody takes them seriously, because the sector analyses them, and 90 % of the deforestation is not connected to the soy supply chain. Then, it has fallen into discredit”. Land use data analysis may diverge upon different methodologies. The soy sector technical report does not consider deforestation when it takes longer to be converted into soy; for example, if a first transitional land use such as pasture occurs before soy, a time lag evaluation does not apply to this land. Therefore, this soy is considered without deforestation (Agrosatélite Applied Geotechnology Ltd., 2021). Whereas land-use dynamics require multiple scales of analysis to capture the direct and indirect deforestation drivers and often consider a five-year allocation period to link the deforestation to a specific land use, and set the indirect drivers of soy-driven deforestation (Gollnow et al., 2022; zu Ermgassen et al., 2024).

Hence, access to data and the ability to work with it according to specific needs have influenced shifts in companies’ risk analysis “The decision for SoyM was political but for the Cerrado it is scientific, now we have science to support the decision” (SPS 04). Despite the large magnitude of soy-driven deforestation in parts of the Cerrado, companies argued that land use change to soy in the Cerrado is not big enough to require a response as stringent as the SoyM (SPS 04, SPS 06). These changes in data availability and companies’ technical empowerment can potentially be seen as a dimension of company power. New

advances in transparency could increase reputational risks to companies, but they could also combat these risks when companies have enhanced capacities to pre-emptively produce and amplify these data through proprietary information about their sourcing zones.

#### 4.5. *The forgone profits of not developing the Cerrado were seen as too high to warrant strict conservation*

At the time when the SoyM was unfolding, the area cultivated with soy in the Cerrado was 11.7 Mha, with a potential expansion of up to 69.5 Mha, while only 1.4 Mha had been developed in the Amazon (Mapbiomas, 2023) with an expansion potential of up to 76.2 Mha (Gollnow et al., 2022; Mapbiomas, 2023). The existing literature also points to major differences in soy profitability across the two biomes, which are mainly related to agricultural suitability, investments in infrastructure, and research and technology (Brannstrom et al., 2008; Garrett et al., 2022, 2013a; Heilmayr et al., 2020; Rausch et al., 2019; Rausch and Gibbs, 2021).

The fact that the Cerrado had a more consolidated agribusiness sector and infrastructure, emphasized by interviewees, reduced the likelihood of a stringent soy deforestation policy in the region. This is translated into greater sunk costs for soy expansion that would represent an economic loss for the industry actors who invested in this infrastructure if not recuperated by future production (Bebbington et al., 2018; Garrett et al., 2013b; Hecht, 2005; Jepson et al., 2010). As described in one interview, “Although the cost of land was lower in the Amazon, the costs of investment would make it unfeasible to start soy production in the Amazon (SPS 08)”. The high opportunity cost of halting soy expansion in the Cerrado dominated the discussions in the GTC, enriched by land use dynamics research (Filho and Costa, 2016; Garrett et al., 2022; Macedo et al., 2012; Strassburg et al., 2014). The compensation mechanism – the CCM – was designed to be attractive enough to prevent the conversion of areas with native vegetation to soy. Indirectly, besides the financial compensation, it was expected that a combined set of policies would drive the production to already cleared lands resulting in more efficient land use in the biome. Land use studies have supported this narrative by mapping huge extents of suitable lands for soy expansion in the Cerrado (Filho and Costa, 2016; Garrett et al., 2022; Rausch and Gibbs, 2021; Soterroni et al., 2019).

However, despite the engagement of researchers arguing about the availability of soy expansion over degraded pasture, the land efficiency rationality was not enough for the Cerrado agreement (SC 01, CSO 04, CSO 01). The soy producers’ association pushed to obstruct the negotiation for two reasons: i) a SoyM in the Cerrado would bring regional economic political conflicts among themselves and potential land speculation since there is still a significant amount of suitable land under native vegetation that could be legally cleared, and ii) on the producers’ side, a stringent policy for the entire Cerrado would increase land prices, therefore institutionally as an association, they were not supportive of the mechanism. Although CCM included land rent value for soy as a key variable to define the compensation amount, it was, to some extent, homogenized to the entire Cerrado, displeasing producers. Interviews revealed that economics’ regionalities weren’t incorporated in the CCM, which could increase the prices of land cleared before the cutoff date, causing an economic disadvantage for some of the producers (SE 01, SPS 08) while others would benefit from that.

#### 4.6. *Shifts in the federal government and congress opened and closed policy windows*

In 2003, when deforestation was skyrocketing in both biomes, Brazilian politics moved to the left with the election of Luis Inácio Lula da Silva as President, affiliated with the Workers Party (Partido dos Trabalhadores – PT). In 2004, the government launched a national program to combat deforestation in the Amazon, the already mentioned PPCDam (Presidência da República Casa Civil, 2003). Several

innovative policies were put in place: i) advanced deforestation monitoring using satellites, including a real-time alert system (DETER – an acronym in Portuguese); ii) a list of embargoed properties that illegally deforested; iii) a list of municipalities with higher deforestation rates in the Amazon, that were annually identified and received differentiated attention and penalties. The Amazon Fund was created in 2008 to manage international donations designated to prevent, monitor, and combat deforestation and promote conservation and sustainable land use in the Legal Amazon. Therefore, when SoyM was negotiated, there was already a strong national effort to reduce deforestation in the Amazon. The soy sector recognizes that “the government was essential for SoyM” (SPS 03). The political context and the policies in place (Furumo and Lambin, 2021) at that moment enhanced the feasibility of the emergence and implementation of the SoyM.

On the other hand, it took 6 years more for the leftwing government to design a strategy to control deforestation in the Cerrado (Ministério do Meio Ambiente, 2014). The Action Plan to Prevent and Control Deforestation and Fires in the Cerrado (PPCerrado – the Portuguese acronym) was launched only in 2010. Yet, the industry and the farmers’ union continued to participate in the Cerrado GTC soy governance discussions until 2017. The farmers’ association only left the discussion when Jair Bolsonaro, the far-right wing candidate, was elected president in 2018. All the monitoring and enforcement tools to implement a Cerrado SoyM were already in place during the GTC negotiations, but the broader public policy enforcement context was dismantled by Bolsonaro (Abessa et al., 2019; Barbosa et al., 2021; Nepstad et al., 2014) (SPS 06, SPS 07, CSO 03, CSO 06). Part of the agribusiness sector (Pompeia, 2021b), mostly the soy producers’ association, strongly supported by the new administration, threatened the SoyM and weakened the negotiations for the Cerrado agreement (SPS 01, SPS 06, CSO 02, CSO 07).

The agribusiness lobby has historically had a powerful political influence in the Brazilian Congress, organizing themselves in its congressional “rural caucus” (*bancada ruralista*), recently strengthened by the Instituto Pensar Agropecuária (IPA – an acronym in Portuguese). This institute prepares and organizes policy responses in Congress through the Agri-livestock Parliament Representation (FPA – an acronym in Portuguese) (Pompeia, 2021a; Russo Lopes and Bastos Lima, 2022). Agribusiness representatives currently hold 58 % of seats in the Brazilian House, and 54 % in the Senate (Parlamentar and da Agropecuaria [WWW Document], 2023) and they act together through the FPA (Pompeia, 2021a). Aprosoja, the largest soy producers’ association, has played a crucial role in bolstering the FPA in the last 10 years and its anti-environmental agenda (Pompeia, 2021b). Nevertheless, our results show that its political influence can vary according to national policy and the cross-cutting effects of the commodities international market (SPS 01).

The growing power of the agribusiness lobby as representatives of farmers’ interests can also be positioned relative to the power of multinational soy traders. Traders are central players in the global food system (Grabs and Carodenuto, 2021), and the soy sector is highly concentrated, with five companies controlling 43.4 % of global trade as of 2017 (Grabs et al., 2021). Yet, within Brazil, their power has been reshaped and attenuated over the years, in consolidated regions shaped by the pivotal role of cooperatives mediating the producer-trader relationship, while from a national perspective, the Brazilian producers’ association helped consolidate power at the producer level and push back against traders (Pompeia, 2022, 2021b, 2021a; dos Reis et al., 2024). This shifting power led to a cracked relationship between farmers and the industry: “Before Bolsonaro, producers were against the Soy Moratoria, but even so, they used to run projects with the industry, like the Soja Plus Program, which provided technical assistance for producers to improve their sustainability. But when Antonio Galvan became Aprosoja’s (the Brazilian soy producers’ Association) president in 2021, he said: “We will break all the relationships and here, in Mato Grosso, ABIOVE can’t come in anymore (SPS 01).” It resulted in the rupture of

the partnership of Aprosoja and ABIOVE, which jointly managed the Program Soja Plus (SPS 01; SPS 02). Galvan was a strong supporter of Bolsonaro while he was Aprosoja Brazil's President (Pompeia, 2021b), which demonstrates that the growing power of soy producers' organization increased, to some extent, the rejection of sustainability programs (dos Reis et al., 2024).

This rupture and the far-right national context constrained further talks of a SoyM in the Cerrado or any soy-related deforestation policies. Our interviews and documentation revealed that while ABIOVE was open to negotiating a set of incentives for the Cerrado, Aprosoja was staunchly against it and put its power to prevent further conservation policies in the region. Aprosoja threatened ABIOVE with antitrust litigation in the case of Soy Moratoria at CADE, the Brazilian Administrative Council for Economic Defense that is responsible for investigating and deciding on business competition, "it was a demonstration of power to curb the Cerrado agreement" (CSO 01, SPS 01). Aprosoja's intimidation had political-ideological alignment with the far-right federal government (*Governo e agricultores unem forças contra moratória da soja na Amazônia [WWW Document], 2019*). The high-level staff of the government publicly voiced against the Soy moratorium, calling it illegal (Girardi, 2019) (SPS 01; SPS 02; CSO 01; CSO 06). According to the soy industry, "Who kills companies, in general, are the governments. That is why the private sector is extremely careful, they can make a decision that complicates our business (SPS 01)". At this point, companies decided it was more important to become politically invisible with respect to voluntary environmental policy in Brazil than to continue to be leaders in Cerrado's stringent VEP discussions (Pompeia, 2022, 2021b). Although there was a cracked relationship between companies and producers because of the tension between the SoyM and the potential Cerrado Agreement, companies maintained their general alignment with the agribusiness political lobby through the support of institutions such as the IPA and the FPA (Pompeia, 2022, 2021a). Companies opted for this invisibility regarding the Cerrado VEP, in favor of their broader political standing.

#### 4.7. Persuasive leadership was critical for taking advantage of this policy window

Our results point out that the success of SoyM's implementation can also be attributed to the leadership of the two senior directors who headed the SoyM governance arena – the GTS, Paulo Adario from Greenpeace, and Carlo Lovatelli, from ABIOVE (SPS 01, SPS 02, SPS 03, SPS 07, CSO 06, CSO 07, SE 02). During the process, a respectful relationship flourished as said: "No one was in charge of anyone, there was no hierarchical relationship between ABIOVE and Greenpeace, and it changed game rules" (SPS 03). Both sides had a pragmatic view and were willing to implement the commitment and make it credible (SPS 03, CSO 06). Greenpeace's strategy to negotiate SoyM in a top-down manner involving consumer goods companies, like McDonald's, turned out to be very successful. Just four months after the "Eating Amazon" report was released, ABIOVE committed to a 2-year SoyM for Amazon. As one civil society actor commented, "It was not expected that the moratorium would be taken as a sectoral decision, it was spectacular!" (CSO 06).

When the GTC was created as a spin-off of the GTS, it also had high-level participation, but its structure differed in many aspects. While the GTS had a format with ABIOVE-Greenpeace setting the agenda, the GTC established a dialogue mechanism facilitated by a consultant and oriented to a broader governance setting. The resulting GTC governance structure ended up being somewhat exclusionary, by maintaining the industry and environmental NGOs on the leadership, and not being able to have a sustained participation of communities or producers, reproducing power asymmetries in environmental governance in the region (especially with respect to local communities directly affected by the soy expansion in the Cerrado) (Bastos Lima and Persson, 2020). Moreover, the Cerrado negotiations emerged in a national politically polarized

environment (SE02), where the GTC's leaders continuously diverged about what to commit and how to implement potential agreements.

## 5. Discussion and conclusion

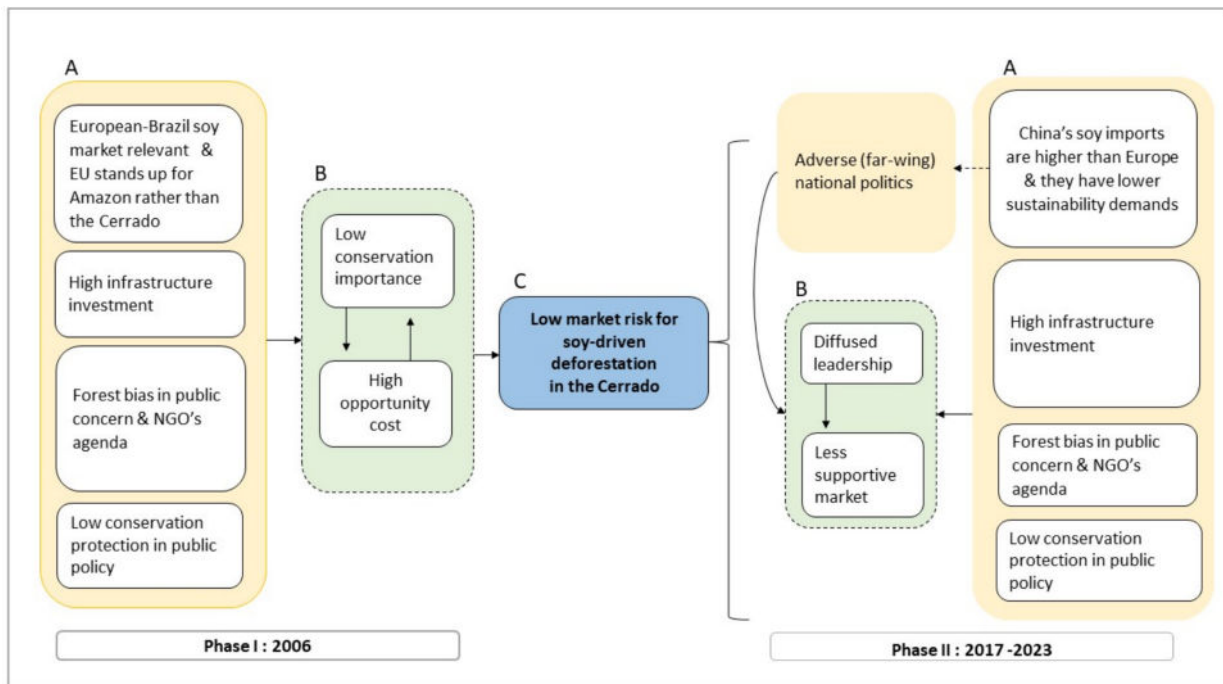
### 5.1. Sustainability in the Cerrado: what is next?

Our study reveals how numerous cultural, political, economic, and organizational factors combined to constrain the adoption of a stringent zero-deforestation industry sector-wise agreement (Table S1), despite the success of the SoyM in the Amazon and the ongoing threats to the remaining vegetation in the Cerrado. Lower public and NGO interest in the Cerrado relative to the Amazon, a greater importance of trade connections with Europe, and higher opportunity costs from restricting soy expansion in the Cerrado were defining features of the focus on the Brazilian Amazon around 2006 when the political conditions of a supportive government and conducive NGO and industry leadership were aligned with VEP adoption. It has also been argued previously that the lower public and institutional concern for the Cerrado relative to the Amazon exacerbated the perceptions of insurmountably high opportunity costs in the Cerrado (Levy, 2022).

With ongoing pressure in the Cerrado, in 2016 greater interest emerged from industry, NGOs, and European markets to conserve that biome as well. By that time, however, the policy window for stringent sustainability action had definitively closed due to the strengthening of an anti-environmental government and increasingly strong producers' representation within the agribusiness sector. This situation was exacerbated through the ongoing investment in the Cerrado soy sector which further cemented the industry's influence in the region and further enhanced the sunk costs and potential profitability of future expansion. This made support for a stringent VEP in the Cerrado not just a low priority, but an active risk for multinational companies. The industry chose to keep its power invisible and not confront the anti-environmental agenda of the soy producers' association, which was increasingly empowered by the far-right government. In the absence of persuasive leadership to convene and persuade others towards a sector-wise solution, this adverse situation could not be overcome. In the meantime, companies made individual global commitments to halt deforestation in their supply chains in a competitive manner, the opposite of the SoyM vision (Gollnow et al., 2022). These individual commitments continue to lack implementation in the Cerrado (Fig. 2).

This historical account of the stringent VEP failure to launch in the Cerrado may serve as a cautionary tale for sustainability actors in the agri-food sector or any other environmental policy scenario. It indicates that there is a need to make sure that sufficient public awareness, i.e., the problem stream, is generated when political and policy windows align for sustainability governance. For example, Greenpeace's campaign against Cargill in the Amazon was wide-reaching and influential in stirring public backlash against deforestation, but crucially overlooked the Cerrado and other biomes. This case thus also underscores the need for activist NGOs to take a more forward-looking approach to ensure they are not exacerbating the invisibilities of certain ecosystems and the displacement of local communities due to the agricultural frontier expansion. Furthermore, the case of the Cerrado VEP demonstrates that land use data manipulation analysis can play an intertwined role in the private or public deforestation policy negotiations, such as the EU Deforestation Regulation (EUDR) (Rainforest Foundation Norway, 2023). From one perspective, the availability of data supports the argument for stricter deforestation policies; on the other hand, the lack of alignment on data sources and methodology can confound negotiations and promote the exclusion of other non-forest natural ecosystems, such as the case for the Cerrado Agreement and the EUDR.

The analysis also suggests a new window for stringent VEP adoption in the Cerrado soy sector may already be aligned with critical changes in the policy and political streams relevant to the sector. Firstly, in 2023



**Fig. 2.** Key political and economic factors that constrained a stringent Cerrado VEP in the soy supply chain. Phase I (A) indicates four factors acting concomitantly and shaping the Low conservation importance for the Cerrado as well as the high opportunity cost of soy (B). These combined factors result in a low market risk for soy-driven deforestation in the Cerrado (C). Phase II (A) factors changed over time, although the forest bias was reduced and more public importance was given to the Cerrado conservation, a new political factor acts strongly over companies' decision-making. These factors result in a combination of the diffused leadership and a less supportive market for Cerrado Agreement negotiations (B) resulting in the persistent low market risk of soy-driven deforestation (C).

there was a major shift in the political spectrum in Brazil with the re-election of Lula, who ran on a strong pro-environment campaign and has already pledged major improvements in deforestation governance. Secondly, the EUDR offers new leverage because it requires companies to first understand the deforestation risk level of the regions where they are sourcing deforestation-risk commodities (including soy) and accordingly undertake due diligence to ensure that no deforestation-linked products are sourced. Yet, the EUDR demonstrates the ongoing high forest bias in international policy because it has not included “other woodlands” so far (though it is planned to be reviewed after one year of EUDR publication). Due to increased public concern about Cerrado deforestation, ABIOVE has implemented an illegal deforestation market exclusion mechanism for Cerrado. This mandate from the EU as an importing region is likely to leverage the conservation of forests; though, at the same time, it risks weakening the conservation effects and governance of SoyM, since the EU DR applies a recent 2020 cut-off date, which means 12 years difference from the SoyM. Thirdly, transnational traders holding 60 % of China’s imports are positioned to push the Chinese market for a more stringent policy on deforestation-free soy, including Cerrado. Therefore, we could expect that the return of the progressive political regime in Brazil may enable the conditions for the adoption of a stricter soy supply chain traceability. This can already be seen in the new Cargill pledge in December 2023 to bring forward the implementation of their commitment to zero-conversion and zero-deforestation for all biomes in South America where they source soy from 2030 to 2025.

Our work also highlights the need for the scientific community to take a longer historical and political perspective on VEPs in addition to the ongoing work on measuring VEP effectiveness. Understanding the conditions that influenced the adoption of VEPs with different levels of stringency may also tell us more about the motivations and constraints that companies face to implement their commitments fully. Similarly, it could benefit companies to be more transparent about the barriers they face in adopting and implementing their policies. Otherwise, the

decisions to not adopt or implement policies and their measured ineffectiveness will just continue to feed into oversimplified narratives of greenwashing. Greenwashing is, of course, part of the story for some companies who actively take advantage of political resistance to partially implement their policies (Grabs and Garrett, 2023). Yet, there are many companies actively trying to reduce deforestation facing real limitations on what they can achieve given the surrounding context.

Notably absent from any of the responses about the SoyM and GTC was any mention of social equity issues. Concern about land grabbing, or indigenous communities and their lack of power was not mentioned as a motivation for adopting conservation policies (or not) in either region. This reflects the additional risks of forest-bias in the scientific, civil society, and public discourse. It not only pulls conservation attention away from non-forest ecosystems, but also away from social issues. While there is room for improvement in the space of VEPs, it is also clear that their conditions for existence rely on a unique set of conditions all coming together to form a policy window. It is very unlikely that these conditions can be replicated in every context. Moreover, the conditions for their effectiveness can also be eroded with changes in public interest and the political and policy environment. They are also tenuous at best with such a narrow focus on controlling deforestation in the context of an economy based largely on agricultural expansion as an engine of economic growth. Thus, greater emphasis on building jurisdictional level cross-sectoral strategies, including those with more of a focus on socio-bioeconomies (De Assis Costa et al., 2021; Garrett et al., 2024) that adds value to the maintenance of forests and non-forest ecosystems remains a more promising route for achieving sustainable, transformative change while centring the well-being of people who live in the Brazilian Cerrado and other ecosystems at risk from agricultural expansion.

**CRedit authorship contribution statement**

**Joyce Brandão:** Writing – review & editing, Writing – original draft, Visualization, Methodology, Investigation, Formal analysis, Data

curation, Conceptualization. **Fatima Cristina Cardoso:** Writing – review & editing, Methodology, Investigation. **Rachael Garrett:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Funding acquisition, Conceptualization.

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## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## Appendix A. Supplementary data

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## Data availability

The authors do not have permission to share data.

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