



# THE STATE OF THE SOY INDUSTRY



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Harvest and Rainforest Foundation Norway, February 2022

Photo: Victor Moriyama for Rainforest Foundation Norway

Graphic design: Anna Maria Pirolt, brodogtekst.no

# INTRODUCTION



FIRE IN THE AMAZON BIOME, AUGUST 2020. (Photo: Victor Moriyama for Rainforest Foundation Norway)

At the COP 26 in Glasgow in November 2021, major commitments were made to end commodity driven deforestation. Pledges were launched by countries<sup>1</sup>, financial institutions<sup>2</sup> and companies, including agricultural trading companies<sup>3</sup>. While these commitments are welcome, it is not the first time these types of commitments have been made. Since the early 2010s, there has been a cascade of commitments to end deforestation caused by commodity production by companies ranging from aquaculture to consumer goods companies and commodity traders<sup>4</sup>. Several corporate actors have also engaged in stakeholder platforms and signed various calls for action.

It is time to take stock of these initiatives and commitments made over the past years. In this report, we focus on one of the key deforestation-risk commodities, namely soybeans. The geographical footprint of the global soy industry has more than doubled between 2000 and 2019, from 26.5Mha to 55.1Mha, with more than half of the world's soy crop produced in South America.<sup>5</sup> Much of that crop expansion has occurred at the expense of forests and native vegetation. Soy production in the region has expanded across a myriad of ecosystems, including the Amazon rainforest, the Atlantic Forest, the Cerrado savannah, the Chaco dry forest and the

Chiquitano savanna. Soy contributes to both direct conversion but also indirect conversion, by soy's displacement of cattle production, pushing demand for new cattle pastures into forests and native vegetation.<sup>6</sup>

Global food systems have become increasingly dependent on this source of protein, mainly as animal feed for meat production<sup>7</sup>. Business-as-usual scenarios assume further growth of the soy industry.

At the same time the continued conversion of native vegetation has negative impact on the future viability and profitability of soy production. Deforestation and conversion of native vegetation to crop and pastureland have changed – and continues to change – climate, weather, and hydrology, leading to less and more unpredictable rain and changes in the rainy season onset.<sup>8</sup> Over time, these changes – exacerbated by global climate change through a 'disastrous mix of floods, drought and intense downpours'<sup>9</sup> – will make crop production in Brazil (including the Cerrado) a risky business, driving crop and revenue losses. Lost soy revenue due to extreme heat from native vegetation loss is already occurring.<sup>10</sup>

## The geographical footprint of the global soy industry has more than doubled between 2000 and 2019



A SOY PLANTATION IN THE STATE OF TOCANTINS, BRAZIL, AUGUST 2020 (Photo: Victor Moriyama for Rainforest Foundation Norway)

The soy industry is at a turning point. What the industry decides to do in the coming years to tackle its deforestation footprint may have far-reaching consequences for biodiversity, climate, food security and the future economic profitability of the sector itself.

In this report we review commitments made by soy traders and evaluate their progress towards meeting goals of deforestation and conversion free production. We also analyze the latest satellite data on deforestation and conversion of native vegetation to understand recent soy-driven deforestation and conversion of native vegetation trends in key frontier areas and to map which traders are most exposed to risk of deforestation and conversion of native vegetation in their supply chain.

While the annual deforestation rates for soy in the Cerrado in 2019 has decreased to less than half of what it was a decade ago, the Cerrado still loses on average an area nearly the size of New York City every year for soy.<sup>11</sup> We present a new analysis using the latest satellite data to understand the deforestation dynamics in the frontiers of expansion in the Cerrado, including Matopiba, where most of the world's

soy-driven conversion is concentrated. In 2019 the Soft Commodities Forum (SCF), a platform formed by six major soy traders ADM, Bunge, Cargill, COFCO, LDC and Viterro (formerly known as Glencore Agriculture), selected 25 municipalities in the Cerrado with high deforestation-risk, as areas for prioritized action by the traders<sup>12</sup>. In the report, we analyze the deforestation-rates and the progress made in reducing deforestation in these 25 priority municipalities. In 2021, this list was expanded to a total of 61 municipalities, which encompass 70% of recent native vegetation conversion to soy in the Cerrado<sup>13</sup>. We also analyze the expansion of infrastructure by the traders and the deforestation risk-exposure in these 61 municipalities.

This analysis provides a more granular understanding of the current shortcomings of the approach taken by soy industry to stop deforestation and conversion of native vegetation, identify where the problem is the most urgent, and help improve future action. Our findings can help to inform the already existing commitments by traders and guide the new pledges made at the COP 26 by governments, financial institutions and corporate actors.

# KEY FINDINGS AND INSIGHTS:

## STATUS OF SOY TRADER COMMITMENTS:

- We evaluated nine soy traders, six of which are members of the Soft Commodities Forum, assessing four key aspects related to implementation of policies for deforestation and conversion-free soy supply chains. We found that soy traders have only partially adopted and implemented the key measures needed to reduce deforestation in their supply chains.
- **Cut-off date:** Amaggi, Bunge, LDC and Viterra's 2025, and ADM and Cargill's 2030 cut-off dates are not aligned with consumer company asks and with proposed EU regulation on deforestation-free products. COFCO International and Gavilon have failed to announce a cut-off date. ALZ Grãos claims a cut-off date of 2020, but its application is not in accordance with recognized principles.
- **Supplier traceability:** Only two companies – Bunge and Amaggi – currently report on the proportion of their indirect suppliers traceable to farm level in Brazil. The remaining seven companies - ADM, ALZ Grãos, Cargill, LDC, COFCO International, Gavilon, and Viterra - do not report on the proportion of their indirect suppliers traceable to farm level in Brazil.
- **Monitoring and reporting on supplier compliance:** Only four companies – ADM, Amaggi, Bunge, and Cargill – report figures on deforestation and conversion-free soy volumes. Of these, only three companies – ADM, Amaggi and Bunge - reflect actual monitoring and performance of suppliers.
- **Non-compliance management:** When it comes to publically disclosed non-compliance protocols Bunge is the only company with a basic description of non-compliant supplier engagement in place. On public grievance procedures ADM is the only trader that publishes a public grievance log. Other traders have a public grievance mechanism for external stakeholders that include soy-related grievances, but do not publish a public grievance log. LDC and ALZ Grãos lack even basic public grievance management procedures and reporting.

## DEFORESTATION HOT SPOTS AND HIGH-RISK TRADERS:

- Collective action by six major traders through the Soft Commodities Forum (SCF) on a conversion-free soy supply chain has not resulted in reduced conversion and deforestation in the 25 high-risk municipalities in the Cerrado, that were selected for prioritized action in 2019.
- In the 25 municipalities initially selected by the six major traders for prioritized action, deforestation and conversion of native vegetation increased by 34% from 2018 to 2020.
- Deforestation and conversion on soy farms located in these 25 priority municipalities increased by 61% from 2018 to 2020.
- In the 61 priority municipalities, an additional 235,917 hectares have been deforested between August 2020 and July 2021. Any soy grown on this area would be non-compliant with the 2020 cut-off dates set by various soy buyers and industry standards.
- Three traders - Bunge, Cargill, and ALZ Grãos - have silos in the four municipalities with the highest deforestation risks.
- A higher concentration of deforestation justifies a more focused and localized approach to zero-deforestation efforts.





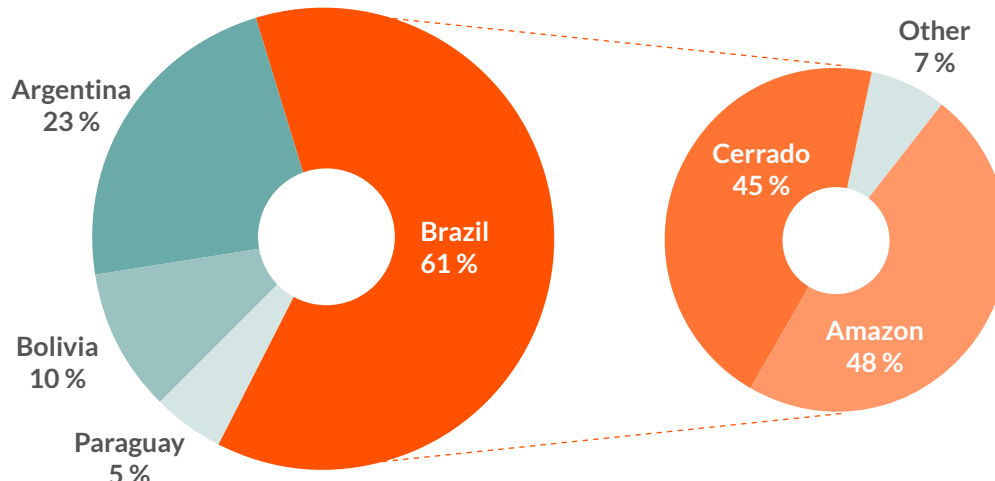
**BRAZIL, AUGUST 2020:** Pedro Alves dos Santos poses for a portrait in front of the Cargill company's soy silos in the city of Barra do Ouro in the state of Tocantins during an expedition by the Rainforest Foundation Norway to monitor the relationship between soy production in Brazil and its relationship with the deforestation of the Cerrado and Amazonia biomes. (Photo: Victor Moriyama for Rainforest Foundation Norway)

### **EXPANSION OF SOY INFRASTRUCTURE IN HIGH RISK AREAS:**

- **Despite the ineffective efforts to reduce deforestation and conversion rates, traders have continued to invest in additional silo capacity in high-risk municipalities.**
- Three traders increased their total silo capacity in the 61 high-risk municipalities by a total of 279,000 tons from 2019 to 2021.
- Bunge expanded its silo capacity by the most of any of the traders in high-risk municipalities (by 115,000 tons), followed by ALZ Grãos (110,000 tons) and COFCO International (54,000 tons).
- Cargill decreased its total silo capacity in the 61 priority municipalities by 15,000 tons. Three traders – LDC, ADM and Amaggi – made no change to total silo capacity.
- Expanding capacity may directly or indirectly add pressure on remaining native vegetation in these areas.

# 1. SOY'S UNSUSTAINABLE GROWTH

## SOY DRIVEN DEFORESTATION IN SOUTH AMERICA<sup>16</sup>



Global soy production has doubled between 2000 and 2019, from 26.4Mha to 55.1Mha, with more than half of the world's soy crop produced in South America.<sup>14</sup> Much of that crop expansion has occurred at the expense of forests and native vegetation. Since 2000, soy production in the region has expanded across a myriad of ecosystems, including the Amazon rainforest, the Atlantic Forest, the Cerrado savannah, the Chaco dry forest and the Chiquitano savanna. Soy contributes to both direct conversion but also indirect conversion, by displacing cattle production and pushing demand for new cattle pastures into forests and native vegetation. Global Forest Watch found that 8.2 million hectares were deforested for soy from 2000-2015, with 97% of that loss in South America<sup>15</sup>. Over 60% of that forest loss due to soy expansion has occurred in Brazil followed by Argentina, Bolivia, and Paraguay.<sup>16</sup>

Other researchers found that about 9% of all of the deforestation in South America from 2000-2016 was linked to soybean production. They found most of South America's direct conversion for soy (defined as planting soy within three years of forest clearance) occurred within the Brazilian Cerrado and within the Brazilian Amazon, and that the Cerrado alone represents roughly half of the continent's direct conversion for soy.<sup>17</sup> Researchers have also found that while most soy expansion in Brazil has occurred on existing pasture, the total amount of pasture in Brazil has largely remained consistent over time,

suggesting that soy expansion onto cleared pasturelands could drive new pasture clearance elsewhere.<sup>18</sup>

Most of Brazil's soy is bound for exports, with 60% of overall soybean production exported in 2020, a number that has dropped to 52% in 2021.<sup>19</sup> In 2019, ten soy traders dominated exports in Brazil: Cargill, Bunge, ADM, Louis Dreyfus Company, Amaggi, Gaviola, COFCO, Glencore, Coamo and Engelhart accounted for 77% of all Brazil soy exports in 2019.<sup>20,21</sup>

### The Cerrado: the global hotspot for soy-driven deforestation

Prior to 2006, much of the globe's deforestation for soy occurred within the Brazilian Amazon. In 2006, spurred by public pressure campaigns, soy traders agreed to eliminate deforestation for soy in the Brazilian Amazon. Within the span of a few years, traders aligned with the Amazon Soy Moratorium (ASM) had adopted effective internal monitoring protocols and measures and excluded non-compliant soy farmers from their supply chains, leading to a dramatic drop in deforestation for soy in the Brazilian Amazon, even while the amount of land soy occupies in the Amazon has increased more than 260%.<sup>22</sup> Those private sector efforts were amplified by policies to protect public lands in the Amazon through various policy mechanisms, combined with enforcement of the Forest Code protections that require farmers to leave 80% of each private property in the Amazon in a 'legal reserve'.<sup>23</sup>



FIRE IN THE CERRADO BIOME, AUGUST 2020. (Photo: Victor Moriyama for Rainforest Foundation Norway)

## **After the ASM adoption until 2017, about 22,000 km<sup>2</sup> were cleared for soy in Brazil across the Amazon and Cerrado; the vast majority - about 80% of that (17,500 km<sup>2</sup>) - was in the Cerrado.**

The ASM and government interventions were successful in contributing to reduce the rate of soy-driven deforestation in the Amazon.<sup>24</sup> However, deforestation for soy continued after 2006, shifting to other ecosystems in Brazil and across the South American continent. After the ASM adoption until 2017, about 22,000 km<sup>2</sup> were cleared for soy in Brazil across the Amazon and Cerrado; the vast majority - about 80% of that (17,500 km<sup>2</sup>) - was in the Cerrado.<sup>25</sup>

While more than two-thirds of the land in the Brazilian Amazon is public and largely in conservation status or allocated for indigenous lands, the neighbouring Cerrado landscape is dominated by private sector interests.<sup>26</sup> Only 7.5% of the Cerrado is in protected areas; on the remaining private lands, landowners are legally allowed to clear 65-80% of each property's native vegetation.<sup>27</sup> Historically this has led to widespread deforestation for crop production and pasture. More than half of the Cerrado has already been cleared<sup>28</sup> - much of it converted to soy.

Researchers found that 18% (1.7 Mha) of soy expansion in the Cerrado between 2001 and 2019 occurred on deforested land, and noted that these findings were consistent with other similar studies.<sup>29</sup> Deforestation rates for soy surge even higher when looking at the frontier of Brazilian soy expansion in the Cerrado - Matopiba (comprised of the state of Tocantins and parts of the states of Maranhão, Piauí and Bahia) - an area containing the Cerrado's largest remaining contiguous areas of native vegetation. Between 2007-2013, researchers found up to 40% of soy expansion in Matopiba occurred on deforested land.<sup>30</sup> A more recent analysis by Trase reported that in the past decade, at least 37% of soy expansion in Matopiba occurred on land cleared within the previous year.<sup>31</sup> Yet another analysis found that soy planted on deforested land made up 36.4% of soy expansion in Matopiba, more than soy planted on land that was formerly pasture (28.6%).<sup>32</sup>

There is some good news. Agrosatélite has found that deforestation for soy expansion across the



## Researchers found that 18% (1.7 Mha) of soy expansion in the Cerrado between 2001 and 2019 occurred on deforested land, and noted that these findings were consistent with other similar studies.<sup>29</sup>

Cerrado has been decreasing in recent years compared to a decade ago. From crop years 2006/07 to 2013/14, deforestation for soy was around 192,000 hectares per year but has now dropped to less than half of that figure, or an average of 73,000 hectares per year from 2013/14-2018/19. Yet this is still equivalent to the clearance of an area the size of New York City for soy every year. Most of this clearance was concentrated in the agricultural frontier region of Matopiba.<sup>33</sup>

The deforestation figures Agrosatélite documented would be even higher if accounting for a five year time lag<sup>34</sup> between forest loss and the appearance of planted soybeans in the Cerrado, given that farmers often need additional time to prepare land, secure licensing and access credit.

Thus, even though not all of this cleared land is immediately planted with soy, over time cleared land is converted to soy. Sometimes it begins with pasture, but is converted later to soy, making soy an indirect driver of deforestation.<sup>35</sup>

A recent analysis by Chain Reaction Research (CRR) found that deforestation continues aggressively across soy farms in the Cerrado<sup>36</sup>, with the analysis showing higher deforestation figures than the Agrosatélite analysis. The CRR analysis documented that 207,813 hectares of deforestation in 2020 took place on existing soy farms, out of a total of 734,010 hectares of clearance across the Cerrado. The study estimated that 28.3% of all Cerrado deforestation was linked to soy expansion. It also found that many of these farms have trading relationships with Cargill, Bunge, ADM, LDC, and COFCO International – in 2020 these farms were responsible for 15,000 hectares of Cerrado deforestation.

### Soy-driven deforestation in biomes across South America

While the Cerrado is currently the largest frontier for soy expansion<sup>37</sup>, other smaller high-risk areas for agricultural expansion for soy exist across Argentina, Paraguay and Bolivia.

Another hotspot for deforestation is the Gran Chaco, which spreads across Paraguay, Argentina and Bolivia, and has lost roughly a fifth of its forests between 1985 and 2016.<sup>38</sup> Most of this loss is

initially for cattle pasture; however, as soy then is planted in old cattle pastures, pasture moves into new frontiers, driving deforestation. Soy is thus an indirect driver of deforestation across many of these frontier regions.<sup>39</sup>

In Argentina, soy made up more than a quarter of the country's exports in 2019.<sup>40</sup> 80% of the deforestation in recent years (2016-2018) occurred in four provinces of Chaco, Santiago del Estero, Salta and Formosa, more than 112,000 hectares were deforested in 2018 alone.<sup>41</sup> Much of this deforestation occurred within the Gran Chaco dry forest ecosystem.<sup>42</sup>

While the Paraguayan Chaco is seeing significant forest loss, to date it is mostly for cattle pastures.<sup>43</sup> Trase documented a small amount of soy production in the Paraguayan Chaco, making up 0.2% of the country's soy crop, with only 465 hectares of direct deforestation for soy in 2018. However, they note that the establishment of new roads combined with government support for development of drought-resistant soy may lead to an acceleration of soy planting, and deforestation for soy in the future.<sup>44</sup> Other researchers note that nearly 750,000 hectares of land in the Paraguayan Chaco are suitable for soybean expansion, with the industry likely to grow once roads in the interior connect to ports for global exports and with the expanded use of drought-resistant genetically modified soy seeds.<sup>45</sup> Currently in Paraguay most soy production occurs in the severely deforested Atlantic Forest. In 2017 Trase estimated around 8,000 ha of illegal soy deforestation risk in exports from the eastern part of the country (excluding most of the Chaco).<sup>46</sup>

In Bolivia, most soy production is located in the Santa Cruz jurisdiction, home to farming hubs alongside tropical forests, including the Chiquitano dry forests ecoregion – an area that suffered from severe fires and destruction in recent years.<sup>47,48</sup> The Santa Cruz jurisdiction is responsible for 68% of all tree cover loss between 2001-2020 in the country.<sup>49</sup> However, there is limited published data allocating deforestation in the region to soy versus cattle or other commodities.

# 2. SOY TRADER COMMITMENTS AND PERFORMANCE

The agricultural commodity traders hold a key position in the supply chain, that allows them to impact the deforestation dynamics through their sourcing policies, infrastructure investments and their relations to farmers.

Most of the major agricultural commodity traders have committed to end deforestation and native vegetation conversion caused by soy. In order to align on efforts on soy sustainability in the Cerrado, the six traders ADM, Bunge, Cargill, COFCO International, LDC and Viterra established The Soft Commodities Forum (SCF). For our analysis we have selected the SCF members<sup>50</sup> in addition to Amaggi, ALZ Grãos and Gavilon<sup>1</sup>.

We evaluated soy traders' progress and delivery on their policy commitments, with specific focus on cut-off dates, monitoring and reporting on DCF figures (and its reliance on traceability), and responses to supplier non-compliance – elements that demonstrate measurable performance against policy commitments. We engaged in direct company communication and reviewed publicly-available materials. See appendix 2 for a list of all company reporting reviewed for this analysis.

## DEFORESTATION AND CONVERSION-FREE (DCF) POLICY

**Best practice: All soy traders should have a policy covering Deforestation and Conversion Free (DCF) soy sourcing aligned with guidance from the Accountability Framework initiative (AFI).**<sup>51</sup>

All of the soy traders, excepting Gavilon and COFCO, have a policy covering Deforestation and Conversion Free (DCF) soy sourcing. Gavilon and COFCO should make it a priority to adopt, publish and demonstrate progress against a DCF policy. COFCO International's own 2019 Sustainable Soy Policy only mentions the protection of High Conservation Value areas, not native vegetation, and does not expressly state a

commitment to no deforestation; however, they are a signatory of the Soy Moratorium and the company's Supplier Code of Conduct requires suppliers to "use environmental practices that avoid deforestation and protect against conversion of natural and critical habitats leading to a loss of biodiversity"

## DCF CUT-OFF DATE

**Best practice: Volumes of soy reported as DCF should use a cut-off date of 2006 in the Amazon and 2020 in the Cerrado and other regions.**

Amaggi, Bunge, LDC and Viterra's 2025 cut-off date, and ADM and Cargill's 2030 cut-off date do not meet the Cerrado SoS recommendations and CGF and NYDF 2020 commitments, nor align with the cut-off date in the proposed EU regulation on deforestation-free products<sup>52</sup>. Note, however, that while Amaggi and Bunge have announced 2025 as their cut-off dates, in practice for monitoring and reporting DCF volumes in the Cerrado (for Bunge) and across the Amazon and Cerrado (for Amaggi), both currently use 2020 as a baseline. ADM uses 2015, the date of its policy introduction, as its baseline for monitoring deforestation in its supply chain. Whereas ALZ indicated in direct communication that it has a cut-off date of 2020, as that was the date when it published its policy, we do not evaluate it as such because it is not in line with the cut-off definitions and criteria used by the Accountability Framework initiative. In February 2022, LDC committed to DCF supply chains by the end of 2025. Gavilon and COFCO, lacking a no deforestation policy, also lack any cut-off date.

## SUPPLIER TRACEABILITY

**Best practice: In order to monitor and report on supplier compliance with DCF practices, soy traders should be able to trace all of their supply base to the farm level. This includes all purchases made via both direct and indirect suppliers (purchases via silos, aggregators, cooperatives, etc.) Furthermore, accurate**

1) Subsequent to our analysis Gavilon was purchased by Viterra: <https://www.prnewswire.com/news-releases/viterra-limited-to-acquire-gavilon-301468422.html>

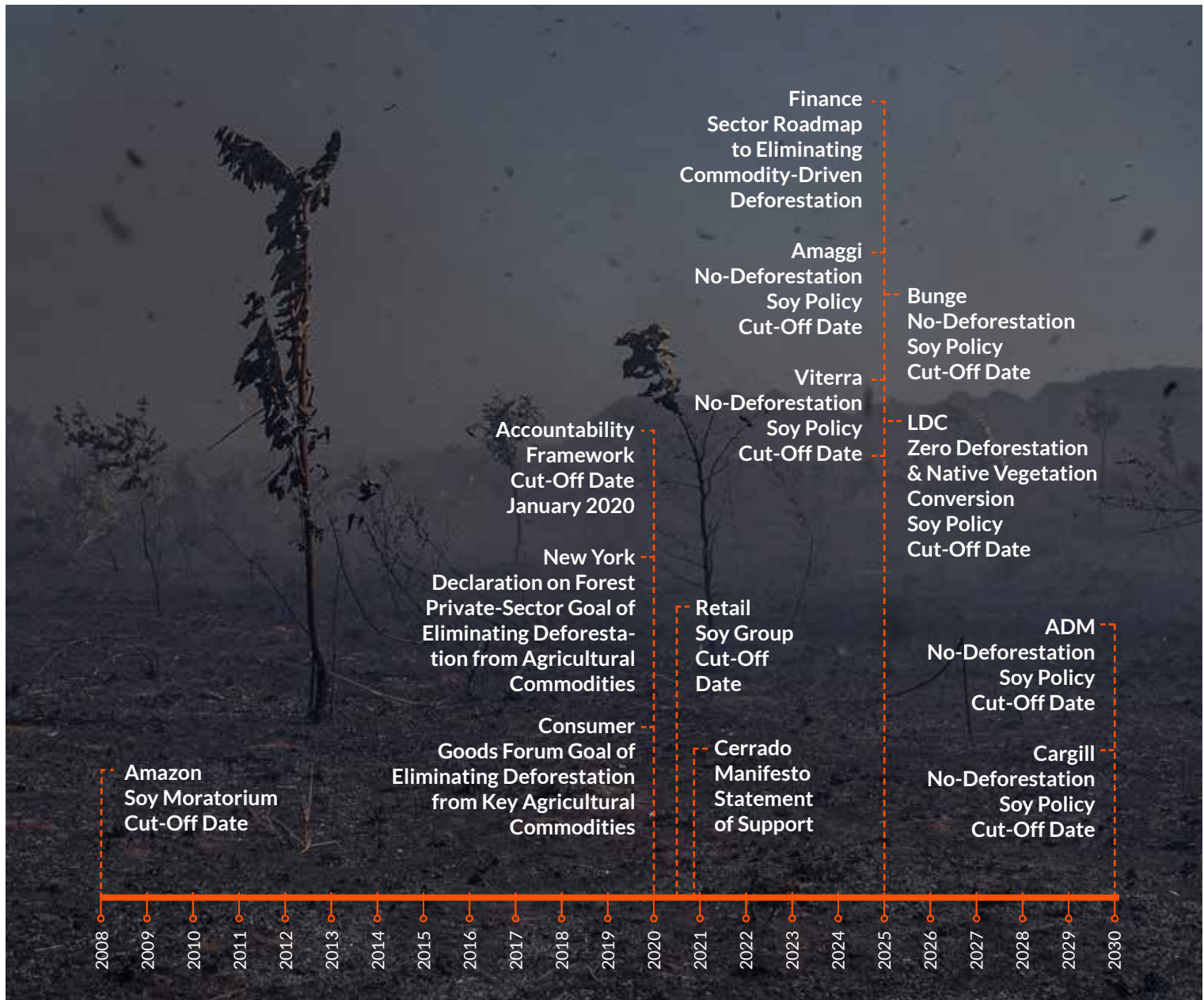


Photo: Victor Moriyama for Rainforest Foundation Norway

**deforestation monitoring – particularly in high-risk regions - requires full farm boundaries/polygons, not just via a single GPS point within a farm.**

Only two companies – Bunge and Amaggi – currently report on the proportion of their indirect suppliers traceable to farm level in Brazil, for the purposes of monitoring of land-use change and reporting. Amaggi indicates that it is the only company which monitors using polygon data, not GPS points, for all suppliers, indirect and direct. Bunge does not clarify if all of its monitoring utilizes polygons.

The remaining seven companies - ADM, ALZ Grãos, Cargill, LDC, COFCO International, Gavilon, and Viterra - do not publicly report on the proportion of their indirect suppliers traceable to farm level in their Brazil supply chain. Yet without tracing suppliers to farm level, traders cannot report meaningfully on supplier compliance with their DCF policies.

To date, the SCF member companies have simply reported on traceability for indirect suppliers to the GPS point of procurement, such as a silo or cooperative. However, these intermediaries obviously cannot be monitored for deforestation. Traders must work with intermediaries to secure farm level data for their indirect suppliers, in order to monitor land-use change at farm level.

Those companies that are SCF members are following the SCF Action Plan and timeline in regard to indirect suppliers. In 2022, SCF members plan to engage with intermediaries (cooperatives, resellers etc.) – who buy directly from the soy farms, on traceability progress, including but not restricted to supporting these intermediaries to develop traceability systems and protocols to access farm-level data for their own supply chains. SCF members will start disclosing progress on the engagement process in the next report, expected to be launched in June 2022.



## MONITORING AND REPORTING ON SUPPLIER COMPLIANCE

**Best practice: Soy traders should monitor their suppliers for DCF compliance. Traders should report on the details of their geospatial monitoring methodology and any technical partners that support DCF monitoring and verification. Finally, companies should report on the total % of their sourced volumes that are DCF and secure independent auditing and verification of their monitoring claims.**

With farm boundary information, traders can monitor for compliance. Many soy traders already have well-established socio-environmental monitoring programs focused on compliance with the Amazon Soy Moratorium, legal requirements, and national and regional programs such as IBAMA embargos, SEMA embargoes, Pará Green Grain Protocol and more.

Outside of coordinated SCF reporting, companies all report performance on traceability, monitoring and DCF compliance differently. Traders generally report by their defined priority (or high-risk) regions, and traders define high-risk regions encompassing parts of the Cerrado differently – from more limited areas (just the 61 high-risk municipalities selected by the SCF), to all of Matopiba, to all of the Cerrado. As a result, comparing supplier performance across companies is impossible. Ultimately companies should report DCF figures not just for high-risk or priority sourcing regions (which differ across companies) but for all of the Cerrado sourcing, all Brazil sourcing, and all of their other South America soy sourcing countries.

Furthermore, to date none of the companies have engaged in independent verification of their DCF figures. Just as Abiove members adopted audited and standardized approaches to verify compliance with the Soy Moratorium in the Brazilian Amazon, soy traders should align around comparative, standardized and audited systems for monitoring, verification and reporting on compliance with DCF policies for their entire supply base, with an initial focus on the Cerrado and eventually expanding across all sourcing countries in South America<sup>2</sup>.

### COMPANIES REPORTING DCF FIGURES

Only 4 companies – ADM, Amaggi, Bunge, and Cargill – report DCF figures. However, Cargill does not report on results from monitoring its actual traceable suppliers but rather estimates by using sector wide data, making its figures unusable for comparative purposes with its peers. Amaggi and Bunge only report for high-risk regions, which they define differently. Furthermore, rather than reporting

overall volume compliant with DCF policies, they both report on the percent of *monitored volume* that is compliant. ADM appears to do the same. Without contextualizing this against overall sourcing volume figures – including unmonitored volumes, the reported DCF numbers (97% for ADM, 95% for Bunge and 99% for Amaggi) can erroneously provide an inflated picture of performance.

While all four companies report differently, making comparisons challenging, we can pick out some interesting signals of progress.

### DCF performance: ADM

The company reports a figure of 97% DCF in its H1 2021 Soy Progress Report. However, like Amaggi and Bunge, it appears that this only covers monitored suppliers. ADM reports reaching 100% traceability and monitoring for direct soy suppliers in Brazil (which represents 64% of their Brazil supply). Assuming that the 97% figure covers only the monitored direct suppliers, our calculations show that 62.1% of their Brazil supply is DCF. While 36% of their Brazil supply is from indirect suppliers; only 5% of that is traced to farm level, and it's unclear what percent of that is monitored and DCF. ADM indicated that most indirect suppliers are cooperatives in the Southern part of the country that integrate smallholders, who have been planting for decades in consolidated farming areas outside of high-risk areas of deforestation for soy. However, they do report a 5-12% share of purchases originating from higher-risk areas. As they trace and monitor higher numbers of indirect farms, that will increase their DCF figure.

<b>TOTAL SOY VOLUMES IN BRAZIL</b>	<b>100%</b>
Directly sourced	64%
<i>Of which monitored</i>	100%
Indirectly sourced	36%
<i>Of which monitored</i>	N/A
Total soy volumes monitored	64%
<i>Of which DCF</i>	97%
<b>Total DCF</b>	<b>62.1%</b>

Source of data: ADM H1 2021 Soy Progress Report

<sup>2</sup> The SCF developed a standardized methodology for reporting volumes DCF in priority municipalities, which was shared as part of the bi-annual SCF reporting in December 2021 (with individual company volumes reporting to commence in June 2022). The SCF indicates that once standard methodologies are in place and adopted by all SCF members, independent verification and assessment will be possible.

### DCF performance: Amaggi

Amaggi traces and monitors soy from both direct and indirect producers, focusing on the Amazon and Cerrado biome, representing 80% of Amaggi's soy volumes in Brazil, with remaining volumes originating from already consolidated regions with low or no deforestation-risk. Amaggi reports that 99% of the *monitored* supply is DCF post-2017 and that 100% from direct suppliers is DCF as of 2020. While they don't report overall DCF figures, we calculated that 81.8% of their Brazil supply is traced and monitored. (They report 75% of their Brazil supply is from direct suppliers, of which 99% is traced and monitored; and that 30% of the remaining 25% of their indirect supply is traced and monitored. 99% of all monitored volumes are DCF). As they trace and monitor higher numbers of indirect farms, that will increase their DCF figure.

TOTAL SOY VOLUMES IN BRAZIL	100%
Directly sourced	75%
Of which monitored	99%
Indirectly sourced	25%
Of which monitored	30%
Total soy volumes monitored	81.8%
Of which DCF	99%
<b>Total DCF</b>	<b>81%</b>

Source of data: Amaggi 2020 Progress Report

Amaggi has a proactive strategy for using the ORIGINAR 2.0 geospatial system to verify supplier performance and compliance before the time of purchase. It uses its ORIGINAR custom-designed system, which identifies and cross-checks for compliance by supplier farms before grain purchase; if there is any non-compliance identified at the time of purchase, the sale registration is automatically blocked and can only be released after confirmation that the purchase meets the company's socio-environmental requirements. However, the company's socio-environmental requirements do not mention any exclusion on the basis of legal deforestation, except for compliance with the Soy Moratorium in the Amazon Biome, the Para Grain Protocol and illegal deforestation based on embargo lists from IBAMA for all biomes in Brazil; Suppliers with recent deforestation and vegetation conversion outside of the Amazon Biome are not blocked for sales, as their cut-off date is 2025, which is also the date of compliance of their policy.

### DCF performance: Bunge

Bunge reported in June 2020 that more than 95% of its *monitored* volumes in South America are DCF. However, Bunge did not report a DCF figure for its overall Cerrado, Brazil, or South America volumes.

Currently, Bunge sources 45% of its Brazilian soy supply from the Cerrado. Bunge has already reached 100% traceability for all direct sourcing in the Cerrado for harvest season 2021 (and monitored 96% of that supply for deforestation). Bunge also traced and monitored 30% of its indirect supply for that season in the Cerrado. As Bunge reports that it sources 79% of its Cerrado soy directly, and 21% indirectly, our analysis indicates that about 82.1% of its total sourced volumes in the Cerrado are currently traceable and monitored. That leaves nearly 18% of its total Cerrado volumes unmonitored – and at risk of feeding deforestation and conversion-linked soy into its supply chain<sup>3</sup>. Ultimately, since 95% of its overall monitored volumes (82.1% of total Cerrado supply) are DCF, we calculate that about 78% of its total Cerrado volumes sourced are DCF. As Bunge improves its traceability and monitoring performance – particularly for indirect suppliers – this DCF number will increase. But currently Bunge remains at risk for about a fifth of its Cerrado sourcing volumes.

We could not calculate a figure for its total Brazil volumes with data provided. Bunge notes that deforestation in Brazil is localized to the regions being monitored by Bunge and the rest of its Brazilian sourcing landscape is not subject to deforestation and is thus considered as a deforestation-free zone. But without reporting at country-wide level for Brazil, it's unclear how much of Bunge's total Brazil volumes are deforestation and conversion free.

### DCF Performance: Cargill

Cargill is the only company reporting an estimated DCF that is not based on actual monitoring of the performance of its supplier farms, but rather using proxies assuming that percentages of DCF soy in its direct supply chain mirror the sector generally. They claim a figure of 96.1% estimated DCF in Brazil. To arrive at this figure, Cargill looked at the sector-wide rate of soy that is DCF in each Brazilian state, and calculated Cargill's own DCF rate using Cargill's soy volumes for the 2019-2020 crop year.

There are a few challenges with a methodology like this – it doesn't look at actual supplier performance within Cargill's supply chain, and the deforestation rates are determined at a state level, which ignores distinctions between rates of deforestation in

<sup>3</sup> Further broken down as 14.7% of its Cerrado volumes – from indirect suppliers - not yet traced and monitored and another 3% of its Cerrado volumes – from direct suppliers - not yet traced and monitored during planting season 2020.

**«Her kan det være fint å bryte med et utrag/sitat fra teksten. Her kan det være fint å bryte med et utrag/sitat fra teksten. Her kan det være fint å bryte med et utrag/sitat fra teksten.»**

frontier regions for soy expansion and long-established soy farms within a state. For example, if Cargill's operations were largely in the frontier portion of a state where deforestation rates are high, but the rate of deforestation is averaged across the state, incorporating lower deforestation rates in non-frontier regions, it could mask Cargill's real exposure to deforestation risk.

A methodology like this could passably serve as a crude indicator of risk and exposure. But it is not the approach Cargill's peers – who are monitoring actual farms at polygon level – are using in order to report DCF figures. Cargill cannot credibly rely on these numbers for dialogue with buyers, financiers and investors. Cargill must continue to build out its polygon/farm boundaries data for all suppliers – direct and indirect – and develop and report on a monitoring and compliance specific to its actual suppliers. Absent monitoring and reporting linked to its actual suppliers, soy buyers, financiers and investors should consider all of Cargill's soy supply at risk for deforestation and conversion.

#### **Companies not reporting DCF figures**

ALZ Grãos, COFCO International, Viterra, Gaviolon and Glencore do not offer detailed public reporting on traceability and do not provide DCF figures for any of their soy sourcing in Brazil. COFCO International and Viterra currently report some traceability data for the priority municipalities under the SCF initiative. ALZ Grãos communicated to us directly that it hired a geospatial firm in 2021 to help trace and monitor its soy crop and that it only sourced 1.5% of its latest 2020/21 soy crop indirectly, thus the origin of the majority of its soy is traceable to farm. LDC has reached 88% traceability for direct suppliers in Brazil, but does not report traceability for indirect suppliers, nor does it report what portion of its Brazil supply comes via indirect vs. direct suppliers. LDC does not report on DCF figures by volume. However, except for LDC's joint venture ALZ Grãos, LDC is more dominant in the most developed and lower-risk regions in Mato Grosso, and thus is less exposed than the companies with large operations in deforestation hotspots. Buyers, financiers and investors should request that LDC report on traceability for indirect suppliers as well as DCF figures by volume for its Brazil operations.

#### **RESPONSE TO SUPPLIER NON-COMPLIANCE**

**Best practice: Soy traders should have grievance mechanisms allowing outside stakeholders to raise concerns about deforestation and policy compliance violations. Traders should report publicly on grievances filed and resulting actions taken.**

Traders should also report on the total number of blocked suppliers/farms resulting from their internal DCF monitoring systems.

Traders should be transparent about their supplier non-compliance protocols. These non-compliance protocols should include corrective actions required for suppliers that engage in deforestation and native vegetation conversion and clarify when suspension is warranted.

#### **Non-compliance related to public grievance procedures**

ADM is the most transparent for public grievance tracking. While all companies (except LDC and ALZ Grãos) have a formal public grievance mechanism for external stakeholders that include soy-related grievances, only ADM publishes a public grievance log. They also report that none of the grievances filed were verified cases of deforestation in their soy supply chain. Cargill lacks a public grievance log, but does report that there were 35 soy grievances filed in the first half of 2021, of which 23% were verified.

All other companies with grievance procedures – COFCO International, Amaggi, Bunge, Gaviolon, and Viterra – fall short in public grievance management, with no public reporting on soy grievance cases filed. COFCO International communicated that it has an internal procedure to address supplier non-compliance, but it is not public; in its 2020 sustainability report the company claims “we no longer trade with non-compliant farms”. Viterra communicated that it has internal procedures to address supplier non-compliance, but does not publish its list of criteria, and descriptions of the criteria appear to be focused heavily on legal and government program compliance. ALZ Grãos communicated that it has internal non-compliance procedures, and will address issues emailed to them via their website contact details. LDC has an Ethics Line to receive and address grievances related to non-compliance with



its policies, including supply chain sustainability grievances, and also reported directly that it has internal non-compliance procedures.

### **Non-compliance related to internal DCF monitoring**

In terms of transparency related to internal DCF monitoring and supplier engagement<sup>53</sup>, Bunge is the only company with a description of non-compliant supplier engagement and basic reporting in place. They adopted these measures as a result of investor engagement by Storebrand Asset Management and Green Century Capital<sup>54,55</sup>. Bunge has published a basic process protocol related to how it engages with suppliers that violate their DCF policy; this process flow includes a 'flag system' and suspension as a possible outcome if a supplier violates Bunge's policy again after initial engagement. Furthermore, Bunge has reported that since 2018, up to 2020, it identified 37 cases of non-compliance with its DCF policy.

Apart from Bunge, no other companies have a public protocol for dealing with supplier non-compliance specific to legally permitted deforestation and conversion.

## **WEAKNESSES AND SHORTCOMINGS IN TRADER'S POLICY IMPLEMENTATION**

### **POST-2020 CUT-OFF DATES**

Post-2020 cut-off dates, combined with the lack of non-compliance mechanisms when clearance is identified, signal to farmers that they can continue to convert land for soy with no economic consequences.

While the major traders have failed to adopt 2020 cut-off dates, major processing, manufacturing and retail sector actors – primarily in Europe – have aligned on a 2020 cut-off date for Cerrado deforestation. More than 160 (mostly European) downstream soy users have signed the Statement of Support (SoS) for the Cerrado Manifesto, asking Brazilian soy traders to stop buying soy linked to Cerrado deforestation occurring after 2020.<sup>56</sup> German soy users followed up with a similar ask for soy traders to adopt a cut-off date in the Cerrado aligned with 2020 global commitments for zero deforestation.<sup>57</sup> Three smaller Brazilian soy traders - CJ Selecta, Caramuru and Imcoba - have already adopted an August 2020 cut-off date.<sup>58</sup> More recently, the Retail Soy Group aligned on an August 2020 conversion and deforestation cut-off date for global soy sourcing<sup>59</sup> and 27 UK businesses<sup>60</sup> signed the UK Soy Manifesto<sup>61</sup>, committing to a cut-off date of January 2020 at the latest. The major soy traders should follow market signals and align with this 2020 cut-off date.

### **LACK OF NON-COMPLIANCE PROTOCOLS FOR SUPPLIERS**

Deforestation cut-off dates are critical to accelerating adoption of DCF practices at farm level.

The traders need to adopt a combination of incentives and disincentive measures to shift farmer performance, so that deforesting farms do not continue to feed into their supply chains. This will require that the soy traders' commercial teams embed these measures into mandatory requirements with commercial consequences.

Soy industry actors have claimed that excluding farmers for violating a ban on conversion would hurt farmers in the Cerrado.

Yet it's a relatively small percentage of farmers that would be significantly impacted by a ban on conversion in the Cerrado. Researchers have found that 83% of soy farms have less than 10 hectares that would be impacted and another 13% have between 10-100 hectares that would be impacted. For these farmers, conserving less than 100 hectares of land would have modest economic repercussions. Only 1829 farms, representing just 4% of all soy farms in the Cerrado, have more than 100 hectares impacted by a proposed ban on clearance.<sup>62</sup>

The Nature Conservancy (TNC) conducted its own analysis on the impact of an end to conversion, and found that Cerrado farms larger than 2500 hectares (representing about 22% of soy farms) have most of the remaining native vegetation (86.5%) that could be legally cleared under current regulations.<sup>63</sup>

Both analyses show that the impacts of a ban on conversion would be disproportionately felt by a relatively small percentage of farms with large remaining undeveloped landbanks.

### **Tracing and monitoring indirect suppliers**

Traceability and monitoring of indirect suppliers remains an outstanding weakness for companies. This can be seen in the SCF's efforts to date, which have focused on tracing direct suppliers. In respect to indirect suppliers, SCF members are expected to trace 100% of indirect suppliers to the loading point (silos, cooperatives, etc.) by end 2021, but not yet trace to farm. Further goals for tracing and monitoring indirect suppliers are 'under development'. Yet within the 61 priority municipalities, traders report that between 12-26% of their supply comes from indirect suppliers. That means even if 100% of direct suppliers in the 61 priority municipalities are traced and monitored (and even if they all showed zero deforestation), deforestation-linked supply is very likely still entering traders supply chains via indirect suppliers.



**BRAZIL, AUGUST 2020:** Trucks loaded with soybeans on a farm in the city of Barra do Ouro in the state of Tocantins. (Photo: Victor Moriyama for Rainforest Foundation Norway)

Traders must develop more robust partnerships and/or impose more stringent requirements with intermediaries like silos and cooperatives for tracing and monitoring their suppliers.

### **Monitoring and reporting of DCF performance**

As outlined earlier, only three companies – ADM, Amaggi and Bunge – monitor and report on compliance (with a 2020 or earlier baseline date) by their actual suppliers. While all three companies have room for improvement, Amaggi and Bunge particularly demonstrate the investment of significant resources in increasing traceability for both direct and indirect suppliers, aiming to ultimately monitor 100% of their supply chain.

The level of DCF monitoring and reporting of the remaining six companies falls significantly behind ADM, Amaggi and Bunge and needs to be improved. Cargill is using imperfect proxies to report DCF figures, while other companies – ALZ Grãos, LDC, COFCO International, Viterra and Glencore – have not aimed to provide any figures whatsoever.

Furthermore, ALZ Grãos, a company with significant deforestation risk in the SCF municipalities – has nominal reporting related to its sustainability commitments. Given its outsized risk in the Cerrado, the company's lack of sustainability progress reporting is of serious concern.

### **Non-compliance and farms deforesting illegally or clearing for other crops**

The major mechanisms that assess deforestation in the soy sector – including the ASM and companies' own supplier compliance approaches – look at native vegetation clearance only for soy planting, not all clearance at a farm level. Only a portion of the deforestation in farms in the Cerrado is linked to direct conversion for soy. Some land is cleared for other crops or initially for cattle pasture.

Land owners are required to obtain a deforestation license from the government before pursuing legally-permitted clearing. To date, soy traders have focused on excluding those suppliers who have already been flagged by the government for legal non-compliance. However, traders should adopt additional due diligence measures to proactively verify compliance with the Forest Code including verification of their suppliers' legal permits for clearance within farms.

Researchers have found that 51% of soy farms have violated the Forest Code through exceeding restrictions on clearance.<sup>64</sup> Trase found that 95% of soy farm deforestation in Mato Grosso, Brazil's largest soy-growing state, was illegal under Brazilian regulations because necessary licenses were not in place.<sup>65</sup> This means that soy could be labeled as deforestation-free, because the product itself was not produced on recently cleared land, even though there is deforestation – possibly even illegal deforestation – occurring within the same farm, for other crops or for pasture.

Traders continue to buy soy from farms clearing land for non-soy purposes, which continues to drive deforestation in the Cerrado. This is likely why, despite monitoring protocols in place, Bunge was criticized for buying soybeans from farms clearing an area twice the size of Manhattan in the Cerrado in 2020, including from companies like SLC Agrícola.<sup>66</sup> SLC Agrícola<sup>67</sup> for example has actively cleared vegetation on some farms for expansion, while selling certified sustainable soy from other farms.

Traders should make clear that they will buy from zero-deforestation and legally-compliant suppliers and farms, not just buy zero-deforestation and legally-compliant soy volumes.

## CASE STUDY:

# SLC AGRICOLA

## dividing farm to produce certified soy for Lidl in one area and continue to deforest in the other area

SLC Agrícola is a soy producer that has caused a lot of concern due to its continued clearance of forest and native vegetation. It has also been implicated in a \$200 million land-grabbing scheme under investigation by Brazilian authorities<sup>1</sup>.

In 2018 SLC Agrícola joined Lidl's sustainable Soy Initiative, aimed to supply certified sustainable and non-GMO soy. Analysis conducted by Chain Reaction Research, shows that after the announcement of this partnership, SLC Agrícola split Fazenda Parnaíba into two separate farms. Most of the planned deforestation would take place at the newly formed Fazenda Palmeira, outside of the scope of the Lidl partnership. This restructuring may enable SLC Agrícola to enter sustainability partnerships, while also continuing to deforest native Cerrado vegetation<sup>2</sup>.

According to monitoring by The Rapid Response monitoring reports, SLC Agrícola is

connected to more than 11,000 hectares of clearance over the two years of from March, 2019 to March 2021<sup>3</sup>.

Based on SLC Agrícola's financial statements from 2020<sup>4</sup>, its main customers are Cargill Agrícola S.A. (22.85 percent of revenues), Bunge Alimentos S.A. (14 percent) and LDC (10.75 percent). All three companies have made zero-deforestation commitments, and SLC Agrícola's recent clearing appears to be in direct violation of the principles of these policies.

This case illustrates why it is important to take a "clean supplier approach" when trying to reach goals of deforestation and conversion-free soy. Focusing merely on deforestation and conversion-free soy volumes can have unintended consequences.



- 1) <https://news.mongabay.com/2021/02/trader-cargill-pension-fund-tiaa-linked-to-land-grabs-in-brazils-cerrado/>
- 2) <https://chainreactionresearch.com/report/slc-agricola-planned-deforestation-could-contradict-buyers-esg-policies/>
- 3) <https://www.mightyearth.org/2021/04/28/mighty-earths-new-monitoring-data-reveals-deforestation-connected-to-soy-trader-and-meatpackers-in-brazil-more-than-doubled-over-two-year-period/>
- 4) <https://api.mziq.com/mzfilemanager/v2/d/a975c39b-3eca-4ad8-9330-2c0a0b8d1060/0a7ca5b9-1dcc-8a12-a2d8-4d5f6e4d438a?origin=1>



# 3. DEFORESTATION HOT SPOTS AND HIGH-RISK TRADERS

The analysis in the previous chapter evaluates soy trader's efforts towards deforestation and conversion-free soy supply chains, by focusing adoption and implementation of four key policy measures: 1) cut-off dates 2) supplier traceability 3) monitoring and reporting on supplier compliance and 4) non-compliance management. Another way of evaluating the effectiveness of the traders policies and assessing their deforestation risks is by measuring deforestation and native vegetation conversion trends in areas with soy expansion.

In this chapter, we examine the 25 municipalities that were selected for prioritized collective action in 2019 by the SCF, and that represent a large share of the recent native vegetation conversion to soy. In 2021, SCF expanded to a total of 61 municipalities, which we also have included in our analysis.<sup>68</sup>

In the SCF December 2020 report, the member companies' reporting cites Agrosatélite's 2020 report findings emphasizing that across the entire Cerrado "only 8% of this territory is planted with soy, and from this area, only 2% [360,000 ha] is linked to recent conversion<sup>4</sup> of native vegetation."<sup>69</sup> Presenting average data about deforestation and conversion for the Cerrado as a whole may obscure the local realities of deforestation dynamics caused by soy expansion. Given that soy driven deforestation is highly concentrated<sup>5</sup>, it is relevant to examine the deforestation and conversion rates in these high-risk areas.

Furthermore, the latest Agrosatélite reports<sup>70,71</sup>, indicate that recent deforestation for soy in the Cerrado does warrant concern – particularly in the agricultural frontier municipalities. Agrosatélite's 2021 report, incorporating an additional year of analysis, showed a jump in soy planted on recently deforested land from 360,000ha to 480,000ha in

just one year, with roughly 77% of that clearance in Matopiba, due to time lags between clearance of forest and planting of soy. The total cleared area is roughly twice the size of Luxembourg. For the Cerrado as a whole, Agrosatélite reports that 8.3% of all new soy expansion came at the expense of forests over a six year period, and in the 61 priority municipalities selected by the SCF, deforestation for soy is even more significant – representing nearly a fifth (18.9%) of all new soy expansion.

## METHODOLOGY

We conducted a deforestation trends and hotspot analysis from 2018-2020 across the 25 initial priority municipalities based on geospatial data provided by Aidenvironment, to assess whether the efforts of the Soft Commodity Forum corresponded with reduced deforestation rates. We did not use the full list of 61 priority municipalities for the trend analysis, as these were chosen in 2021 after the analysis period.

We used Prodes data from 2018-2020<sup>6</sup> to analyze the deforestation trends within focus municipalities, as well as trends within soy farms (according to the 2018 Agrosatélite properties with soy layer<sup>72</sup>)<sup>7</sup>. This approach provides insights that are additional to other analyses that exclusively assess whether soy was grown on deforested land, as it also captures deforestation that takes place on other areas of the farms that supply the soy traders.

We also used Mapbiomas data to determine land-use in the region, including what percentage of farmland is used for soy and what percentage is used for pasture, to understand in which municipalities soy production is the dominant farming activity. In such cases, we conclude that there is an elevated risk that overall deforestation figures are a proxy for non-compliant soy sourcing.

4) Recent conversion is defined as that over the course of a five year period, from 2013/14-2018/19.

5) With 61 municipalities representing 70% of recent native vegetation conversion to soy in the Cerrado according to Agrosatélite

6) Prodes data from 2018 covers August 2017-July 2018, from 2019 covers August 2018-July 2019, and from 2020 covers August 2019-July 2020

7) Given that our soy farms data layer defines soy farms as those with planted soy only in the year 2017-2018, our calculations of deforestation falling in properties with soy farms is conservative.



**FIRE IN THE CERRADO BIOME, AUGUST 2020.** (Photo: Victor Moriyama for Rainforest Foundation Norway)

We identified soy exporter silos registered in the official Conab database (SICARM) in these 25 municipalities in 2019 and 2021. This allows us to review the risk profiles of individual soy traders, as those with silos in municipalities with high deforestation rates may be more at risk.

Finally, we looked at recently published deforestation data covering the period between August 2020 and July 2021, to see the total amount of hectares of clearance that is potentially non-compliant with industry and stakeholder standards. This analysis also looks at soy properties across the full set of 61 priority municipalities.

#### **DATA FINDINGS**

The full results of the analysis can be found in appendix 1. Our analysis presents:

- Deforestation and conversion trends in the initial 25 priority municipalities from 2018 to 2020
- Trader presence in the highest risk municipalities
- Trader expansion of silos in all 61 priority municipalities
- Deforestation and conversion in 61 priority municipalities as of the August 2020 cut-off date

#### **Changes in deforestation in initial 25 SCF priority municipalities between 2018 and 2020**

The initial 25 SCF priority municipalities saw an increase in deforestation in 2020 of 34% compared to 2018 figures (Table 2); that increase rises to 61% if looking at deforestation only within soy properties. Total deforestation and conversion of native vegetation in the 25 SCF municipalities increased 12% from 2018 to 2019 and again by 19% from 2019 to 2020 (from 105,970 to 118,600 and then 141,492 hectares). 44% of that total deforestation occurred in existing soy properties.

12 of the 25 SCF priority municipalities saw a rise in deforestation and conversion of native vegetation from 2018 to 2020, while 13 municipalities saw a decrease in deforestation and conversion of native vegetation in 2020. In 5 of the 12 municipalities, deforestation and conversion of native vegetation more than doubled over the two-year period.

When looking only within soy properties, total deforestation and conversion of native vegetation in the 25 SCF municipalities increased 24% from 2018 to 2019 and again by 30% from 2019 to 2020 (from 41,923 to 52,140 and then 67,571 hectares). 17 of the 25 SCF priority municipalities saw a rise in deforestation and conversion of native vegetation in properties with soy from 2018 to 2020, while 8 municipalities saw a decrease in deforestation and conversion of native vegetation from 2018 to 2020.

**TABLE 2: DEFORESTATION TRENDS IN 25 SCF MUNICIPALITIES FROM 2018-2020, RANKED FROM HIGHEST TO LOWEST IN TERMS OF % CHANGE IN DEFORESTATION**

25 PRIORITY MUNICIPALITIES	STATE	Percentage of farmland used for soy (in %)	Percentage of farmland used for pasture (in %)	Total deforestation 2018-2020 (ha)	Relative increase/decrease in deforestation 2018-2020 (in %)	Total deforestation 2018-2020 in properties with soy (ha)	Relative increase/decrease in deforestation 2018-2020 in properties with soy (in %)	Deforestation in properties with soy (%)
Currais	Piauí	60 %	0 %	9 066	365 %	5 583	234 %	62 %
Mirador	Maranhão	26 %	29 %	13 553	202 %	2 308	40 %	17 %
Balsas	Maranhão	85 %	3 %	33 581	137 %	14 042	233 %	42 %
Formosa do Rio Preto	Bahia	79 %	2 %	39 709	131 %	29 410	500 %	74 %
Baixa Grande do Ribeiro	Piauí	87 %	0 %	17 634	118 %	14 436	212 %	82 %
Goiatins	Tocantins	41 %	48 %	9 425	93 %	5 614	40 %	60 %
Aparecida do Rio Negro	Tocantins	67 %	28 %	1 724	58 %	982	-79 %	57 %
Carolina	Maranhão	38 %	49 %	8 724	45 %	1 648	720 %	19 %
São Desidério	Bahia	50 %	5 %	15 221	38 %	8 693	141 %	57 %
Sambaíba	Maranhão	78 %	6 %	4 273	36 %	2 813	7 %	66 %
Campos Lindos	Tocantins	82 %	9 %	3 774	24 %	1 445	-27 %	38 %
Porto Nacional	Tocantins	36 %	51 %	5 136	20 %	1 990	99 %	39 %
Riachão das Neves	Bahia	47 %	19 %	8 644	-3 %	4 004	43 %	46 %
Mateiros	Tocantins	90 %	0 %	6 015	-10 %	7 285	2 %	121 %
Uruçuí	Piauí	86 %	0 %	15 750	-13 %	16 490	10 %	105 %
Ribeiro Gonçalves	Piauí	92 %	0 %	2 753	-16 %	1 930	-92 %	70 %
Monte do Carmo	Tocantins	46 %	42 %	6 111	-18 %	2 387	37 %	39 %
Peixe	Tocantins	19 %	74 %	6 030	-20 %	3 617	-48 %	60 %
Jaborandi	Bahia	37 %	20 %	13 015	-21 %	15 107	-16 %	116 %
Lagoa da Confusão	Tocantins	5 %	40 %	5 123	-23 %	709	91 %	14 %
Correntina	Bahia	43 %	13 %	16 336	-32 %	11 329	13 %	69 %
Campos de Júlio	Mato Grosso	82 %	8 %	5 603	-36 %	3 408	4 %	61 %
Pium	Tocantins	10 %	74 %	8 570	-38 %	2 801	-65 %	33 %
Santa Rosa do Tocantins	Tocantins	52 %	41 %	3 499	-64 %	2 892	-74 %	83 %
Planalto da Serra	Mato Grosso	22 %	54 %	827	-81 %	708	-56 %	86 %
<b>Total in the 25 initial priority municipalities</b>				<b>260 098</b>	<b>34 %</b>	<b>161 634</b>	<b>61 %</b>	<b>62 %</b>



In eight of the twelve municipalities that saw an increase in deforestation and conversion, it is highly likely that soy is the dominant driver. These are municipalities where more than half of all farmland is used to grow soy, and where less than 30 percent is used for cattle rearing.

### Trader presence in the highest risk municipalities

It is important to note that not all traders have equal exposure to the high-risk municipalities. Companies that participate in the Soft Commodities Forum regularly publish data on how much soy they source from the Cerrado, and what percentage comes from the 61 priority municipalities. The table below illustrates that Bunge is the trader with the highest relative exposure to these municipalities, whereas COFCO and LDC have only limited exposure.

**TABLE 1: SCF MEMBERS SOURCING FROM HIGH-RISK MUNICIPALITIES**  
Brazil soy sourced from 61 priority high-risk municipalities (in %)

COMPANY	BRAZIL SOY SOURCED FROM 61 PRIORITY HIGH-RISK MUNICIPALITIES (IN %)
ADM	15.8%
Bunge	23.4%
Cargill	15.2%
COFCO	11.2%
LDC	5.5%
Viterra	14.2%

Source: Soft Commodities Forum (2021)<sup>73</sup>

Trader risk exposure can also be assessed by looking at the presence, capacity and expansion of trader silos in the region. For this analysis, we looked at traders' asset locations within the municipalities with the highest absolute levels of deforestation as well as increases in deforestation in recent years.

We identified the municipalities of the priority 25 with most worrying deforestation trends. Four municipalities stand out because rates of deforestation are going up instead of down, while most of the farmland is dedicated to soy production: Formosa do Rio Preto, Balsas, Uruçuí and Baixa Grande do Ribeiro. These four municipalities:

- Are among the municipalities with the highest absolute deforestation rates in all of the Cerrado<sup>74</sup>
- Are among the municipalities with the greatest increase in deforestation rates.
- Have the vast majority of farmland dedicated to soy - Formosa do Rio Preto (79% of farmland is soy), Balsas (85%), Uruçuí (86%) and Baixa Grande do Ribeiro (87%).

We found that only three out of the nine traders - Bunge, Cargill, and ALZ Grãos - have silos in these four very high-risk municipalities, with Bunge having the highest exposure in silo tonnage. (See table 7 in the appendix for source data).

**TABLE 3: SOY TRADER PRESENCE (SILO CAPACITY) IN VERY HIGH-RISK MUNICIPALITIES**

MUNICIPALITY	TRADER SILO CAPACITY IN MUNICIPALITY
Formosa do Rio Preto	Bunge (170,000 tons), Cargill (50,000 tons), ALZ Grãos (50,000 tons)
Balsas	ALZ Grãos (51,000 tons), Cargill (42,800 tons), Bunge (39,800 tons)
Uruçuí	Bunge (125,800 tons), ALZ Grãos (53,700 tons)
Baixa Grande do Ribeiro	Bunge (29,900 tons)

Source: SICARM and company communication

### Trader infrastructure expansion in the 61 priority municipalities

We also evaluated traders' silo expansion in all 61 municipalities from 2019-2021 by comparing public data from 2019 and 2021. Traders that expand their silo capacity may be directly or indirectly driving increased deforestation in the high-risk regions.

According to public data, three traders increased their total silo capacity in the 61 priority municipalities by a total of 279,000 tons - Bunge (115,000 tons), ALZ Grãos (110,000 tons) and COFCO International (54,000 tons). Cargill decreased its total silo capacity in the 61 priority municipalities by 15,000 tons. Three traders - LDC, ADM and Amaggi - made no change to total silo capacity. Two traders - Viterra and Gaviolon - do not have any silos in the region.

Of special note is Bunge's expansion in high-risk municipalities. Based on figures provided by SICARM (Brazil's national cadaster of storage units), Bunge expanded its silo capacity by the most of any of the traders (by 115,000 tons) between 2019 and 2021.

Of particular concern is the expansion in Formosa do Rio Preto, Bahia, which had the highest amount of deforestation of all 61 municipalities from 2018-2020 as well as the highest levels of deforestation within soy properties. In this municipality, 79% of farmland is used for soy (and only 2% used for cattle pasture), implying that most of the deforestation is likely for soy production.<sup>75</sup> Bunge's silo capacity figures are also higher in São Desidério, the municipality with the third-highest rates of deforestation of all 61 municipalities. Bunge should not be expanding capacity in these severely high-risk and high-deforestation municipalities unless the company has stringent protections in place to prevent deforestation, including strict traceability to farm and monitoring mechanisms to verify all soy is deforestation-free.

**Deforestation in priority municipalities non-compliant with the 2020 cut-off date**

In January 2022, Brazil's space agency published the official deforestation data for the Cerrado for the period of August 2020 to July 2021. In the 61 priority municipalities analyzed above, an additional 235,917 hectares have been deforested between August 2020 and July 2021. Any soy grown on this area would be non-compliant with the 2020 cut-off dates set by various soy buyers and industry standards, and may pose a material business risk to soy traders.

The latest data illustrates that deforestation is increasingly concentrated in specific hotspots. As analyzed by IPAM, a record percentage of Cerrado deforestation occurred within the Matopiba region last year (61.3%).<sup>76</sup> In line with IPAM's conclusions, the data from the subset of the initial 25 municipalities also shows a greater concentration of deforestation risks. The five biggest contributing municipalities account for 56.5% of all 2021 deforestation within this geography (81,106ha out of 143,515ha), compared to 40.2% in 2018 (42,576ha out of a total of 105,970ha). The major hotspots of Cerrado deforestation in 2021 were the municipalities of Balsas in the state of Maranhão, and the municipalities

of São Desidério, Formosa do Rio Preto, Jaborandi and Correntina in the state of Bahia. These are all major soy producing regions, with the share of agricultural land used for soy ranging from 85% (Balsas) to 37% (Jaborandi).

Since August 2020, 40 percent of all deforestation in this geography took place on properties on which soy has been grown in the past. This equals more than 57,000 hectares of deforestation risk, when assessed against the 2020 cut-off dates. In the hotspots of Formosa do Rio Preto (64.1%) and Jaborandi (78.4%), soy properties account for the majority of deforestation.

Traders most at risk of handling non-compliant soy from these hotspots again include Bunge (silo presence in Balsas, Formosa do Rio Preto and São Desidério), Cargill (silo presence in Balsas, Formosa do Rio Preto and São Desidério) and ALZ Grãos (silo presence in Balsas and Formosa do Rio Preto). 2018 trade data from Trase confirms that these same traders sourced the most soy from these areas, while also listing ADM as a major trader in Balsas and São Desidério, COFCO in São Desidério, and Marubeni and Viterra in Balsas.<sup>77</sup>

A higher concentration of deforestation justifies a more localized approach to zero-deforestation supply chains. Traders with substantial exposure to the above-mentioned municipalities should ensure the strictest implementation of their zero-deforestation commitment in these landscapes, including a forceful non-compliance protocol that applies to the full farm property of their direct and indirect suppliers.

**TABLE 4: POST AUGUST 2020 DEFORESTATION IN 61 SCF PRIORITY MUNICIPALITIES**

	Deforestation falling in properties with soy (in ha)	Deforestation August 2020 to September 2021 (in ha)	Deforestation in properties with soy (in %)
Total in the 25 initial priority municipalities	57,082	143,515	40%
Total in the other 37 municipalities	23,340	92,402	25%
Total in the 61 priority municipalities	80,423	235,917	34%

# 4. RISKS AND FUTURE TRENDS IMPACTING SOY PRODUCTION AND DEMAND

While the USDA predicts global soybean trade to expand by 26.7% through 2030, the largest jump among bulk commodities<sup>78</sup>, there are a number of trends that could disrupt this projection. This includes climate and weather risks that threaten Brazilian soy crop viability as well as the market forces which will shape market demand, investment and financing for soy – and particularly Brazilian soy - in the future. Most of these trends could pose great risk for the soy sector, leading to a loss of market access, loss of investment capital, and possibly stranded assets in the farmland sector.

In terms of market risk, one trend is increasing advocacy and market signals from global soy buyers looking to disassociate from deforestation risk. Another is shifts in investment and capital, including exclusion and divestment, from global investors and financiers in the soy sector looking to reduce exposure to deforestation risks. Yet another trend is policy frameworks originating from the EU, aimed at eliminating risk and imports linked to deforestation.

Soy may also be exposed to technological risks that could lead to a reduction in demand due to the rise of alternatives. The rise of alternative proteins and a shift away from soy-based animal feeds could create substantial changes in the demand for soy.

Finally, the growth of the biofuels market could accelerate the demand for soy, if direct and indirect land-use changes linked to deforestation are not appropriately addressed.

## PRODUCTION RISKS FOR THE SOY SECTOR

### Climate and weather risks

Deforestation and conversion of native vegetation to crop and pastureland has changed – and continues to change – Brazil's climate, weather, and hydrology, leading to less and more unpredictable rain as well as changes in the timing of the start of the rainy season.<sup>79</sup> Over time, these changes – exacerbated by global climate change through a 'disastrous mix of floods, drought and intense downpours'<sup>80</sup> – will make crop production in Brazil (and particularly the Cerrado) a risky business.

These changes introduce major risk to the Cerrado's double-cropping operation. Farmers in the region are economically reliant on a double-cropping approach, which allows for the planting of corn or other crops after a first successful soy crop cycle. Late planting due to changes in seasonality, compounded by lower yields due to crop stress from droughts, lower rainfall and extreme high temperature days, introduces financial risk for farmers and soy traders. In short, deforestation reduces agricultural revenues.<sup>81</sup> Lost soy revenue due to extreme heat from native vegetation loss reached an average of \$99 per hectare in 2012, and with agricultural growth and increased ecosystem conversion, could grow 25% to 95% by 2050.<sup>82</sup>

### Social risk and land conflicts

The growth of soy has seen increased concentration of land – and profit - in the hands of fewer farmers. In Brazil only 10% of soy production comes from smallholders (less than 50 hectares), with most of the rest of the production coming from farms greater than 500 hectares.<sup>83</sup> The highly mechanized soy monocrop industry employs only one employee per each 200 hectares of cropland, significantly fewer employees per hectares than smallholder farms.<sup>84</sup>

This trend of large farms is even more pronounced in the Cerrado. Understanding the economics of agricultural growth in the Cerrado, as well as the size of farms in the Cerrado is critical for contextualizing the impacts of ending further conversion. While generally soy has been seen to improve the economic situation in the Cerrado, it has also been critiqued for driving inequalities in the region<sup>85</sup>, concentrating wealth in the hands of a privileged elite and large land-owners while exacerbating challenges for and excluding smallholders and local communities whose activities are disrupted by industrial-scale soy production.<sup>86,87</sup> The average soy farm in Brazil is 130 hectares while the average Cerrado soy farm is significantly larger. These average between 1000–2000 hectares in size, but can reach to 10,000 hectares.<sup>88,89</sup> As of 2006, roughly just 6% of producers in Matopiba generated over 85% of the rural income<sup>90</sup> - largely from largescale industrialized farms with minimal numbers of employees.





**BRAZIL, AUGUST 2020:** Valéria Pereira dos Santos works with agrarian conflicts at the NGO Pastoral Land Commission in the state of Tocantins. From an expedition by the Rainforest Foundation Norway to monitor the relationship between soy production in Brazil and its relationship with the deforestation of the Cerrado and Amazonia biomes. (Photo: Victor Moriyama for Rainforest Foundation Norway)

In addition to driving increased social inequality, industrial soy expansion in Brazil has been linked to other social problems such as conflicts related to water, land grabs, interruptions in food production, exclusion from governance, and forced labor.

Water conflicts include overuse of water resources, diversions of streams and river water, depletion of groundwater sources, and preventing water access to local communities. Conflicts over water have arisen between community members and grain farms in Piauí.<sup>91</sup> Water conflicts also arise over contamination from fertilizer and pesticide application and run-off. Brazil is the globe's largest buyer of pesticides, and uses many products banned around the world, with soy making up about half of the pesticide usage.<sup>92</sup> Pesticide application has led to poisoning of school-children and members of rural communities in agricultural areas<sup>93</sup> and documented pesticide contamination in water, air, blood and breast milk of women living near farms.<sup>94</sup>

Land grabs and conflicts related to large-scale farm development are common in Brazil. Brazil's Comissão Pastoral da Terra (CPT) has documented 1,576 land conflicts in 2020 alone, the highest figure in their 35 years of tracking conflicts.<sup>95</sup> Many of these are related to large-scale farms and land grabs. Illegal land grabs, through a process called 'grilagem', involve harassment, threats, or limitations on access imposed on local community members, followed by forgery of property titles.<sup>96</sup> Following this, the land is often sold to

farmland investors.<sup>97</sup> Traditional communities consequently face negative livelihood impacts – such as interruptions in local community food production due to the loss of communal grazing sites and pesticide contamination of wild foods and planted crops. Often these conflicts lead to legal battles, such as the conflict over land title in Piauí, in the Malencias community, after the use of police and threats against community members<sup>98</sup> to expel families so that the farmland could be sold.<sup>99</sup> Violent conflicts and murders over land, as well as lawsuits over land, have also emerged in other soy-growing regions of Brazil.<sup>100</sup>

Another ongoing land conflict is in Brazil's fourth largest soy producing municipality, Formosa do Rio Preto, which is also the SCF priority municipality with the largest amount of deforestation from 2018-2020. A legal battle has emerged over land access rights for seven local traditional communities bordering a soy 'mega-farm' named Estrondo, said to be linked to one of the biggest land grabs in Bahia state history.<sup>101</sup> Pesticides used on the soy farm have run-off into the Rio Preto, the locals' drinking water source. Fences were built, blocking villagers from access to traditional lands, and Estrondo's paid armed guards have allegedly harassed community members in the region<sup>102</sup> and shot locals over grazing conflicts.<sup>103</sup> One of the largest land-grabbing cases in Brazil is in Formosa do Rio Preto, involving allegations related to 360,000 hectares of land tenure insecurities in the JJF Holding case.<sup>104</sup>

## «Land grabs and conflicts related to large-scale farm development are common in Brazil. Brazil's Comissão Pastoral da Terra (CPT) has documented 1,576 land conflicts in 2020 alone, the highest figure in their 35 years of tracking conflicts.»

Conflicts such as these have prompted the leader of Articulação dos Povos Indígenas do Brasil, a Brazilian indigenous rights organization, to call on the EU to impose sanctions on soy particularly from the mid-eastern part of Brazil.<sup>105</sup>

Perhaps soy has also been linked to slavery in Brazil. Of 50,000 plus rescues of slaves in Brazil since 1995, 1826 of those rescues were from farms mainly producing soy.<sup>106</sup>

Social issues like the ones outlined above fail to get enough traction in efforts led by multi-stakeholder groups focused on sustainability in the soy sector.

### MARKET RISKS FOR THE SOY SECTOR Global soy buyers and investors reducing their risks

Some soy buyers – particularly supermarkets, retailers and the fish farming sector – have begun to distance themselves from the risks posed by the major soy traders. Spurred by the French due diligence law, seven French supermarkets, including Carrefour and Casino, imposed deforestation clauses for soy in supplier contracts,<sup>107,108</sup> while poultry firm LDC adopted a 2020 cut-off date for Cerrado conversion and requires suppliers to provide traceability data for verifying compliance.<sup>109</sup>

Norwegian fish farming companies have for years used certified soy from Brazil to verify that it is conversion free, and in January 2021 launched an agreement<sup>110</sup> where the three Brazilian soy suppliers to the salmon industry, CJ Selecta, Caramuru and Imcopa/Cervejaria Petrópolis, committed to being fully deforestation-free, with August 2020 as the cut-off date and only purchase deforestation-free soy for all traded volumes. The Salmon Group<sup>111</sup> and Bremnes Seashore<sup>112</sup>, stopped sourcing any soy whatsoever from Brazil to limit risk. Norway's Grieg Seafood excludes Cargill Aqua Nutrition from its Green Bond funds purchases, due to Cargill's links to deforestation-risk soy in the Cerrado.<sup>113</sup> These shifts mean that most of the global salmon production now sources only deforestation-free Brazilian soy volumes supplied by deforestation-free soy companies, committed to a 2020 cut-off date.<sup>114</sup> However, it is important to note that Cargill is one of the suppliers of fish-feed to the salmon industry, and its customers will yet not have fully deforestation-free

suppliers. More recently, the Retail Soy Group has released guidance for soy buyers<sup>115</sup> and 27 UK businesses signed the UK Soy Manifesto<sup>116</sup>, aiming to eliminate deforestation-linked soy imports no later than 2025.

At other times companies have targeted specific traders with sanctions, suspensions, or new supplier requirements. In 2019, Nestlé stopped sourcing Cargill's Brazilian soy in response to Cargill's potential links to deforestation in Brazil, though the focus was the Amazon.<sup>117</sup>

In terms of investment capital, investors to date have largely voiced concerns about risk, with a major push in 2019 when 57 investors representing \$6.3 trillion in assets called on the soy sector to address deforestation risks in their supply chains.<sup>118</sup> Some investors, like Storebrand, have started to adopt their own Deforestation Policies, and act on these by filing related resolutions with companies they invest in and have recently placed Bunge and ADM on an observation list.<sup>119,120</sup> Danske Bank has already excluded Cargill, Bunge and ADM from two of its funds on the basis of "biodiversity impact", including deforestation risk in Brazil.<sup>121</sup> At the COP26, 30 financial institutions representing \$8.7 trillion in assets agreed to eliminate forest-risk commodity-driven deforestation in their investment portfolios by 2025.<sup>122</sup>

### Governments imposing restrictions on deforestation-linked soy

The past decade has seen increased regulatory efforts to address deforestation-related imports, in the EU and the United States. Governments began by cracking down on illegal deforestation and conversion – as well as violations of human rights – through initiatives like the UK Illegal Deforestation Law<sup>123</sup> and the more recent proposed 'FOREST Act of 2021' in the U.S.<sup>124</sup>

Yet in recent years regulatory frameworks have increasingly aimed at more comprehensive protections for forests and native vegetation, even if conversion is legally permitted in the production region. The EU is the largest importer of global soybean meal and the second largest importer of raw soybeans<sup>125</sup>. The European Commission has proposed a due diligence law that aims at preventing the import of agricultural



**BRAZIL, AUGUST 2020:** The Cachoeira community has lived in the region for generations of families. In recent years, conflicts with Fazenda Estrondo have intensified, involving legal disputes and death threats. The Estrondo farm irregularly occupied areas belonging to the community for soy planting. Historically, the Estrondo farm has collected accusations of slave labor and violence against local communities. (Photo: Victor Moriyama for Rainforest Foundation Norway)

commodities that have caused deforestation<sup>126</sup>. EU efforts to reduce soy imports from Brazil or limit imports linked to deforestation could have a significant impact on the global demand for soy from South America, although uncertainty remains about the scope of the legislation in biomes such as the Cerrado.

The French government adopted the French National Strategy to Fight Imported Deforestation in 2017, imposing due diligence requirements and generating risk for downstream buyers of soy. Twenty French companies called on soy traders to demonstrate compliance with the requirements.<sup>127</sup> The French government has also signaled intent to reduce soy imports from Brazil because of deforestation risk and recently named agriculture traders Bunge and Cargill as the leading importers of soy from areas at risk of deforestation.<sup>128,129</sup> The soy sector should expect to see additional regulation emerging in the coming years, aimed at reducing both legal and illegal deforestation for soy.

### **PROTEIN DISRUPTIONS: THE SHIFT AWAY FROM THE USE OF SOY FOR ANIMAL FEED**

Three-quarters of global soy production is currently used for animal feed.<sup>130</sup> Yet, future projections indicate the world may be shifting dramatically away

from the use of soy as animal feed. Climate change forces us to radically rethink global food systems and there are no pathways to meeting the Paris Objectives without completely halting global deforestation.<sup>131</sup>

### **Alternative-protein feed additives**

Concerns about the climate and land-use implications of traditional animal feeds (such as soy) are likely to drive a future of increased alternative-protein feed additives. Marks & Spencer stopped using soy feed for its store-brand milk (replacing it with rapeseed oil and sugar beet), due to concerns that it could not guarantee the feed, much of which originated in South America, was deforestation-free. This is part of the company's strategy to diversify feed beyond soy, exploring alternative proteins.<sup>132</sup> Other companies may well follow suit.

Edible insects and other protein sources are seen as eco-friendlier alternatives to soy. Pea starch has been identified as a frontrunner alternative to soy for animal feed, given high amounts of protein and starch and equivalent nutritional value to soy. This pea starch market is expected to exceed \$544 million in just five years.<sup>133</sup> Insect production at scale requires no chemical fertilizers or pesticides and has a smaller land and water footprint than traditional



**<<In a high demand scenario for biofuels, consumption for soy-based biofuels may grow to 41 million tons by 2030, equivalent to around three quarters of current global production of soy oil. Such an increase in soy oil consumption would entail expected additional deforestation of 1.8 million hectares by 2030.>>**

soy and other feedstock production, which currently dominates a third of all global cropland.<sup>134</sup> While insect meal is currently a supplement for soy feed, over time it could replace an estimated 25-100% of soymeal.<sup>135</sup> It's been suggested that insect meal could replace 20% of the UK's growing soy imports by 2050.<sup>136</sup> The market for alternative protein sources for feed (such as insects or pea starch) is expected to exceed \$4 billion by 2026.<sup>137</sup>

Companies are even shifting into synthetic protein development. Scientists are aiming to turn industrial emissions into animal feed<sup>138</sup> by separating CO<sub>2</sub> from other gases, then producing protein.<sup>139</sup> One day synthetic proteins may be more cost-competitive than insects and other current alternatives.

### **Shift to 'clean meat' and plant-based protein alternatives**

Currently, an increasing demand for soy is driven largely by increases in meat-based diets, particularly in the developing world. For example, China – the globe's largest soy importer – saw a 2,000% increase in soy imports over a two-decade period, largely for animal feed.<sup>140</sup> Yet even in China, these trends may reverse in the coming decades, as China is seen as the 'new battleground' for alternative protein and dairy players.<sup>141</sup> China recently released its five year agricultural plan, which includes for the first time cultivated meats and other alternative proteins as part of its blueprint for ensuring future food security.<sup>142</sup>

As noted in the Economist, "cows are no longer essential for meat and milk: you can do it all with plants."<sup>143</sup> This is the same for other protein sources. Not only is it increasingly economically viable to substitute meat and dairy with plant-based substitutes, it's becoming preferred for many, due to health and environmental concerns. This preference is expected to grow in the decades ahead. While in 2020 consumption of alternative proteins made up just 2% of the animal protein market, that figure could grow to as much as 11% of the market (or more) by 2035, constituting a \$290 billion industry. In fact, some are calling 2025 the year of "peak meat" in Europe and North America, implying the transition is already underway.<sup>144</sup> Price parity for plant-based meats to match or drop below processing costs for animal meat is expected in 15-20 years.<sup>145</sup> Other analysts expect much more accelerated shifts – RethinkX has

projected that non-animal protein sources could be five times cheaper than animal-derived proteins by 2030.<sup>146</sup>

Nested within alternative proteins fall lab-grown 'clean' or cultured meat products. The market is expected to reach USD \$593 million by 2032, driven by everything from nimble start-ups to investments and product lines launched by traditional meat firms like Cargill, JBS<sup>147</sup> and Tyson Foods. Poultry, which makes up roughly half of all current soy feed use, is projected to dominate the market share of lab-grown meats.<sup>148</sup>

As plant-based and clean meat protein alternatives reach economies of scale, the production costs will go down. Once it is cheaper to produce – and purchase – animal-free protein alternatives to real meat (and eggs and dairy products), there may be a rapid shift in the consumption of meat, eggs, and dairy, although the question remains how long this will take.

### **GROWTH IN DEMAND FOR BIOFUELS**

While the trends outlined above may drive a reduction in the production and demand for soy, one trend – the growth in demand for biofuels – may partially offset possible reductions in demand for soy. According to analysis published by Rainforest Foundation Norway, current global ambitions for increased use of biofuels are likely to lead to a massive increase in demand for soy oil. In a high demand scenario for biofuels, consumption for soy-based biofuels may grow to 41 million tons by 2030, equivalent to around three quarters of current global production of soy oil. Such an increase in soy oil consumption would entail expected additional deforestation of 1.8 million hectares by 2030.<sup>149</sup>

Brazil has a growing domestic biodiesel mandate, with the mandated blend reaching an 11 percent blending ratio in 2019, and scheduled to increase to a 15 percent blending ratio by March 2023. The USDA forecast 3.7 million tons of biodiesel consumption in 2019, of which 70 percent is soy oil based, representing about 2.7 million tons of soy oil demand. According to Rainforest Foundation Norway's estimate of a high demand scenario, additional soy oil demand from Brazil's biodiesel mandate may reach as much as 10.2 million tons in 2030.

To date, the increased demand for biofuels – combined with record high prices for soy – have also driven additional investments and infrastructure development by the soy sector. However, this relies on a regulatory environment that favors the inclusion of soy as an approved biofuel.

Recent policy interventions in Europe are aimed at reducing support for high ILUC-risk biofuel feedstocks. The EU's recast Renewable Energy Directive (RED II) introduced a new category of 'high ILUC-risk' biofuel feedstocks, defined as those where 10% or more of new area of that global feedstock were established on land meeting high carbon stock definitions. Unless the high ILUC-risk rules are changed, support for these crops will be phased out by 2030. Analysis by the European Commission in 2019 identified soy as a feedstock associated with deforestation, though only 8% of its expansion occurred on previously high carbon stock land (below the 10% threshold). The analysis is currently being updated, and if this figure increases beyond 10%, or the rules and threshold shift, soy could be indicated as a high ILUC-risk feedstock.<sup>150</sup>

Furthermore, EU Member States may phase out support for specific types of biofuels on the basis of ILUC risk from as early as 2021 should they choose to do so, and a growing number have decided on an earlier phase-out of soy oil. These include France, the Netherlands, Denmark, and Belgium. Net zero 2050 goals, combined with the electrification of transport, and an increasing use of hydrogen and synthetic fuels, could mean that in the lead-up to 2050, biofuels will play less of a role in global energy systems.

### CONCLUDING REMARKS

Despite the soy traders making commitments to reducing deforestation, we see that deforestation – including in soy properties – has been increasing in recent years in priority municipalities. The fact that deforestation for soy is highly concentrated in a small number of municipalities should make it easier for the traders to achieve zero-deforestation and zero-conversion targets. However, while the deforestation has increased in the priority municipalities, companies have at the same time expanded their silo capacity in these priority municipalities.

Increases in deforestation are reflected in the traders' inadequate approaches to monitoring suppliers and addressing supplier non-compliance. Widespread gaps in transparency and reporting remain common within traders' approaches as disclosed in their sustainability reports.

Science points to the physical risks of deforestation on soy yields and productivity. Local climate change impacts are already impacting the industry, and this is likely to get worse in the coming decades. Business-as-usual may not be viable for much longer due to

risk of crops failure, double cropping of land might not be feasible and the profitability of the sector may take a substantial hit. Thus, it is both in the interest of soy producing countries, import markets, of the global community and of the traders and other companies that purchase and use soy in their products, to put an immediate halt to further expansion over native vegetation. A failure to adequately respond will lead to a myriad of physical climate change impacts, including failure of agricultural crops and supply chain disruptions. Social conflicts remain, and soy continues to drive inequality throughout the region. In addition to the risks of reduced yields and productivity, as well as social conflicts, the sector is also faced with growing transition risk.

As a result, being reliant on soy continues to expose businesses to deforestation risk and reputational risk and regulatory risk. Conversion of native vegetation and forests for soy remains a significant problem that the soy sector must urgently address in the frontier regions. However, investors, financiers, and soy buyers and users aren't doing enough to penalize poor performance and accelerate quick action by the traders.

In the palm oil sector, consumer-facing palm oil buyers were willing to suspend problematic suppliers and drive change through their economic power. The downstream soy buyers have, to date, been largely unwilling to drive that change. It is time for soy buyers across the board to demonstrate their willingness to sever business relationships with traders who fail to demonstrate measurable progress towards eliminating deforestation from their soy supply chains aligned with that 2020 cut-off date.

These soy buyers and users – supported by investors and financiers – have a role to play in driving the soy sector to take necessary action, now.

**«The fact that deforestation for soy is highly concentrated in a small number of municipalities should make it easier for the traders to achieve zero-deforestation and zero-conversion targets.»**

# APPENDIX 1: DATA SOURCES

TABLE 5: DEFORESTATION TRENDS 2018-2020 (PRODES DATA) FOR 25 PRIORITY MUNICIPALITIES

25 priority municipalities	State	Percentage of farmland used for soy (in %)	Percentage of farmland used for pasture (in %)	Deforestation Prodes 2018 (Aug17/July18) (ha)	Deforestation 2018 in properties with soy (ha)	Deforestation Prodes 2019 (Aug18/July19) (ha)	Deforestation 2019 in properties with soy (ha)	Deforestation Prodes 2020 (Aug19/July20) (ha)	Deforestation 2020 in properties with soy (ha)	Total deforestation 2018-2020 (ha)	Total deforestation 2018-2020 in properties with soy (ha)	Deforestation in properties with soy (%)	Relative increase/decrease in deforestation 2018-2020 (in %)	Relative increase/decrease in deforestation 2018-2020 in properties with soy (in %)
Currais	Piauí	60%	0%	1 265	675	3 189	2 657	5 877	2 252	10 331	5 583	54%	365%	234%
Mirador	Maranhão	26%	29%	3 669	926	2 467	86	11 086	1 297	17 222	2 308	13%	202%	40%
Balsas	Maranhão	85%	3%	9 534	2 079	11 010	5 034	22 571	6 929	43 115	14 042	33%	137%	233%
Formosa do Rio Preto	Bahia	79%	2%	7 823	2 563	21 649	11 465	18 061	15 383	47 533	29 410	62%	131%	500%
Baixa Grande do Ribeiro	Piauí	87%	0%	4 735	2 232	7 298	5 231	10 337	6 973	22 369	14 436	65%	118%	212%
Goiatins	Tocantins	41%	48%	2 545	1 623	4 512	1 714	4 912	2 277	11 970	5 614	47%	93%	40%
Aparecida do Rio Negro	Tocantins	67%	28%	486	396	958	503	766	82	2 209	982	44%	58%	-79%
Carolina	Maranhão	38%	49%	3 642	129	3 456	457	5 267	1 061	12 365	1 648	13%	45%	720%
São Desidério	Bahia	50%	5%	8 809	2 307	3 050	834	12 170	5 552	24 029	8 693	36%	38%	141%
Sambaíba	Maranhão	78%	6%	1 615	1 000	2 083	747	2 191	1 066	5 888	2 813	48%	36%	7%
Campos Lindos	Tocantins	82%	9%	1 608	651	1 787	317	1 987	477	5 382	1 445	27%	24%	-27%
Porto Nacional	Tocantins	36%	51%	2 433	451	2 219	640	2 917	899	7 568	1 990	26%	20%	99%
Riachão das Neves	Bahia	47%	19%	4 397	1 530	4 393	295	4 251	2 180	13 041	4 004	31%	-3%	43%
Mateiros	Tocantins	90%	0%	4 882	3 223	1 627	763	4 389	3 299	10 897	7 285	67%	-10%	2%
Uruçuí	Piauí	86%	0%	8 086	4 567	8 700	6 892	7 050	5 032	23 836	16 490	69%	-13%	10%
Ribeiro Gonçalves	Piauí	92%	0%	1 552	1 076	1 455	769	1 298	86	4 305	1 930	45%	-16%	-92%
Monte do Carmo	Tocantins	46%	42%	2 816	460	3 805	1 296	2 306	630	8 927	2 387	27%	-18%	37%
Peixe	Tocantins	19%	74%	3 922	1 665	2 895	1 078	3 135	874	9 952	3 617	36%	-20%	-48%
Jaborandi	Bahia	37%	20%	8 315	6 919	6 426	2 365	6 589	5 824	21 330	15 107	71%	-21%	-16%
Lagoa da Confusão	Tocantins	5%	40%	3 718	197	2 276	134	2 846	377	8 840	709	8%	-23%	91%
Correntina	Bahia	43%	13%	6 152	2 494	12 123	6 006	4 213	2 829	22 488	11 329	50%	-32%	13%
Campos de Júlio	Mato Grosso	82%	8%	3 198	920	3 542	1 532	2 061	956	8 800	3 408	39%	-36%	4%
Pium	Tocantins	10%	74%	6 295	1 710	4 679	496	3 891	596	14 865	2 801	19%	-38%	-65%
Santa Rosa do Tocantins	Tocantins	52%	41%	2 700	1 674	2 517	775	981	443	6 198	2 892	47%	-64%	-74%
Planalto da Serra	Mato Grosso	22%	54%	1 775	454	485	56	341	198	2 601	708	27%	-81%	-56%
<b>Total in the 25 initial priority municipalities</b>				<b>105 970</b>	<b>41 923</b>	<b>118 600</b>	<b>52 140</b>	<b>141 492</b>	<b>67 571</b>	<b>366 061</b>	<b>161 634</b>	<b>44%</b>	<b>34%</b>	<b>61%</b>



**TABLE 6: DEFORESTATION (DETER) POST AUGUST 2020 (TO SEPT 2021)**

61 SCF priority municipalities (initial 25 in blue)	State	Deter (Aug20/Sep21) (ha)	Falling in properties with soy (ha)
Luís Eduardo Magalhães	Bahia	7,651	4,242
Pastos Bons	Maranhão	568	121
Currais	Piauí	7,374	5,645
Mirador	Maranhão	5,040	2,646
Sebastião Leal	Piauí	2,258	513
Balsas	Maranhão	16,371	5,693
Formosa do Rio Preto	Bahia	15,622	10,301
Buritzeiro	Minas Gerais	1,803	-
Baixa Grande do Ribeiro	Piauí	6,336	3,632
Goiatins	Tocantins	3,786	2,151
Cabeceiras	Goiás	316	204
Aparecida do Rio Negro	Tocantins	128	88
Sucupira do Norte	Maranhão	2,123	445
Carolina	Maranhão	4,048	108
São Desidério	Bahia	23,584	7,372
Sambaíba	Maranhão	1,508	229
Niquelândia	Goiás	2,661	1,027
Abreulândia	Tocantins	1,831	1
Gilbués	Piauí	866	855
Campos Lindos	Tocantins	376	118
Araguacema	Tocantins	4,320	498
Riachão	Maranhão	4,148	1,403
Porto Nacional	Tocantins	1,854	634
Dois Irmãos do Tocantins	Tocantins	2,915	0
Itacajá	Tocantins	1,737	36
Corrente	Piauí	669	57
Riachão das Neves	Bahia	3,819	1,468
Caxias	Maranhão	6,329	209
Gurupi	Tocantins	168	-
Fernando Falcão	Maranhão	1,302	704
Mateiros	Tocantins	2,138	581
Cristalina	Goiás	2,027	1,204
Uruçuí	Piauí	5,241	3,213
Ribeiro Gonçalves	Piauí	668	337
Monte do Carmo	Tocantins	890	118
Água Boa	Mato Grosso	447	311



61 SCF priority municipalities (initial 25 in blue)	State	Deter (Aug20/Sep21) (ha)	Falling in properties with soy (ha)
Santa Maria do Tocantins	Tocantins	531	145
Peixe	Tocantins	2,543	733
Jaborandi	Bahia	11,615	9,210
Unaí	Minas Gerais	1,572	1,007
Paracatu	Minas Gerais	929	597
Caseara	Tocantins	296	280
Lagoa da Confusão	Tocantins	3,884	1,699
Correntina	Bahia	8,610	2,413
Novo São Joaquim	Mato Grosso	962	214
Campos de Júlio	Mato Grosso	2,667	2,352
Marianópolis do Tocantins	Tocantins	472	166
Novo Acordo	Tocantins	1,016	86
Pedro Afonso	Tocantins	901	311
Alto Araguaia	Mato Grosso	896	-
Santa Filomena	Piauí	5,385	1,229
Pium	Tocantins	1,358	190
Barreiras	Bahia	7,155	2,846
Campo Novo do Parecis	Mato Grosso	1,180	0
Barra do Ouro	Tocantins	102	1
Água Fria de Goiás	Goiás	351	162
Poxoréu	Mato Grosso	959	165
Santa Rosa do Tocantins	Tocantins	310	45
Nova Nazaré	Mato Grosso	730	427
Itapiratins	Tocantins	233	86
Planalto da Serra	Mato Grosso	207	121
<b>Total in the 25 initial priority municipalities</b>		<b>105,622</b>	<b>45,933</b>
<b>Total in the other 36 municipalities</b>		<b>92,166</b>	<b>34,714</b>
<b>Total in the 61 priority municipalities</b>		<b>197,787</b>	<b>80,648</b>

**TABLE 7: SOY TRADER SILOS IN HIGHEST RISK MUNICIPALITIES**

Company	Silos Ownership	CNPJ	Silos Municipality	Silos State	Silos Type	Capacity (tons)	Latitude	Longitude
BUNGE	BUNGE ALIMENTOS S/A	65.5104.0001-3	Uruçuí	PI	Graneleiro	99 418	-7,37810	-44,39602
BUNGE	BUNGE ALIMENTOS S/A	65.5104.0003-0	Uruçuí	PI	Bateria de Silos	26 366	-8,28591	-44,57187
AMAGGI-LDC	AMAGGI LOUIS DREYFUS ZEN-NOH GRAOS S.A.	65.E322.0001-7	Uruçuí	PI	Graneleiro	53 730	-8,29300	-44,54600
BUNGE	BUNGE ALIMENTOS S/A	65.5104.0005-6	Baixa Grande do Ribeiro	PI	Graneleiro	29 898	-8,24161	-45,22022
BUNGE	BUNGE ALIMENTOS S/A	49.5104.0008-9	Balsas	MA	Bateria de Silos	39 780	-7,51629	-46,07036
CARGILL	CARGILL AGRICOLA S A	49.0239.0001-9	Balsas	MA	Graneleiro	20 700	-7,51508	-46,05554
CARGILL	CARGILL AGRICOLA S A	49.0239.0004-3	Balsas	MA	Graneleiro	19 930	-7,51541	-46,05562
CARGILL	CARGILL AGRICOLA S A	49.0239.0005-1	Balsas	MA	Silo	2 180	-7,51562	-46,05614
AMAGGI-LDC	AMAGGI LOUIS DREYFUS ZEN-NOH GRAOS S.A.	49.E322.0001-5	Balsas	MA	Graneleiro	51 040	-8,02452	-45,59893
BUNGE	BUNGE ALIMENTOS S/A	65.5104.0001-3	Uruçuí	PI	Graneleiro	99 418	-7,37810	-44,39602
BUNGE	BUNGE ALIMENTOS S/A	65.5104.0003-0	Uruçuí	PI	Bateria de Silos	26 366	-8,28591	-44,57187
AMAGGI-LDC	AMAGGI LOUIS DREYFUS ZEN-NOH GRAOS S.A.	65.E322.0001-7	Uruçuí	PI	Graneleiro	53 730	-8,29300	-44,54600

TABLE 8: SOY TRADERS SILO EXPOSURE IN 61 PRIORITY MUNICIPALITIES, 2019-2021

2019

Company	Silos Ownership	CNPJ	Silos Municipality	Silos State	Silos Type	Capacity (k tons)	Latitude	Longitude	Source
ADM	ADM DO BRASIL LTDA	56.9481.0014-7	Campo Novo do Parecis	MT	Convencional	57 000	-13,6600	-57,8954	Company review
ADM	ADM DO BRASIL LTDA	39.9481.0002-3	Luís Eduardo Magalhães	BA	Graneleiro	57 000	-12,1117	-45,9602	Company review
AMAGGI	AMAGGI EXPORTACAO E IMPORTACAO LTDA	77.294.254/0010-85	Campos de Júlio	MT	Fundo V	60 000	-13,42073	-59,1557	Company review
AMAGGI	AMAGGI EXPORTACAO E IMPORTACAO LTDA	77.294.254/0010-85	Campos de Júlio	MT	Silo A 200	30 000	-13,42073	-59,1557	Company review
AMAGGI	AMAGGI EXPORTACAO E IMPORTACAO LTDA	77.294.254/0007-80	Campo novo do Parecis	MT	Fundo V	60 000	-13,4019	-57,5325	Company review
AMAGGI	AMAGGI EXPORTACAO E IMPORTACAO LTDA	77.294.254/0007-80	Campo novo do Parecis	MT	Fundo V	40 000	-13,4019	-57,5325	Company review
AMAGGI	AMAGGI EXPORTACAO E IMPORTACAO LTDA	77.294.254/0007-80	Campo novo do Parecis	MT	Silo	1 800	-13,4019	-57,5325	Company review
BUNGE	BUNGE ALIMENTOS S/A	56.5104.0048-0	Baixa Grande do Ribeiro	PI	Graneleiro	29 898	-8,2416	-45,2202	SICARM
BUNGE	BUNGE ALIMENTOS S/A	56.5104.0047-2	Balsas	MA	Bateria de Silos	39 781	-7,5163	-46,0704	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0016-2	Barreiras	BA	Graneleiro	24 000	-11,4950	-46,1604	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0039-1	Campo Novo do Parecis	MT	Graneleiro	44 720	-13,6172	-57,9011	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0037-5	Campos de Júlio	MT	Graneleiro	47 830	-13,7039	-59,2631	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0038-3	Campos Lindos	TO	Bateria de Silos	12 823	-8,0521	-46,3932	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0046-4	Correntina	BA	Bateria de Silos	37 720	-13,5618	-46,1129	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0028-6	Currais	PI	Graneleiro	30 229	-8,7975	-44,6289	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0024-3	Formosa do Rio Preto	BA	Graneleiro	50 000	-10,5561	-45,6078	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0026-0	Luís Eduardo Magalhães	BA	Graneleiro	790	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0027-8	Luís Eduardo Magalhães	BA	Silo	95 120	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0029-4	Luís Eduardo Magalhães	BA	Graneleiro	95 120	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0030-8	Luís Eduardo Magalhães	BA	Graneleiro	95 120	-12,0931	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0031-6	Luís Eduardo Magalhães	BA	Graneleiro	85 270	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0033-2	Luís Eduardo Magalhães	BA	Graneleiro	69 250	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0034-0	Luís Eduardo Magalhães	BA	Bateria de Silos	41 880	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0035-9	Luís Eduardo Magalhães	BA	Bateria de Silos	21 250	-12,0934	-46,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0025-1	Luís Eduardo Magalhães	BA	Bateria de Silos	20 430	-12,1114	-46,2971	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0020-0	Luís Eduardo Magalhães	BA	Silo	12 600	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0032-4	Luís Eduardo Magalhães	BA	Silo	5 470	-12,0934	-45,8172	SICARM







2019

Company	Silos Ownership	CNPJ	Silos Municipality	Silos State	Silos Type	Capacity (k tons)	Latitude	Longitude	Source
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0018-9	Luís Eduardo Magalhães	BA	Graneleiro	1 330	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0040-5	Luís Eduardo Magalhães	BA	Silo	2 870	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0045-6	Luís Eduardo Magalhães	BA	Graneleiro	1 480	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0021-9	Pedro Afonso	TO	Silo	16 064	-9,0084	-48,1682	SICARM
BUNGE	BUNGE ALIMENTOS S/A	80.5104.0003-3	Porto Nacional	TO	Graneleiro	29 680	-10,6779	-48,3915	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0017-0	Riachão	MA	Silo	12 996	-7,4404	-46,3350	SICARM
BUNGE	BUNGE ALIMENTOS S/A	80.5104.0001-7	Riachão das Neves	BA	Bateria de Silos	48 000	-11,3202	-45,5516	SICARM
BUNGE	BUNGE ALIMENTOS S/A	65.5104.0005-6	São Desidério	BA	Bateria de Silos	39 810	-12,7641	-45,9439	SICARM
BUNGE	BUNGE ALIMENTOS S/A	49.5104.0008-9	São Desidério	BA	Graneleiro	46 000	-12,7641	-45,9439	SICARM
BUNGE	BUNGE ALIMENTOS S/A	49.5104.0005-4	Uruçuí	PI	Bateria de Silos	26 366	-8,2859	-44,5719	SICARM
BUNGE	BUNGE ALIMENTOS S/A	65.5104.0001-3	Uruçuí	PI	Graneleiro	99 418	-7,3781	-44,3960	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0007-3	Formosa do Rio Preto	BA	Graneleiro	62 130	-11,4467	-46,3979	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0022-7	Formosa do Rio Preto	BA	Graneleiro	51 200	-11,0105	-46,1623	SICARM
BUNGE	BUNGE ALIMENTOS S/A	80.5104.0005-0	São Desidério	BA	Graneleiro	39 370	-13,1849	-46,0323	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0041-3	Riachão das Neves	BA	Bateria de Silos	56 440	-11,5345	-45,9213	SICARM
BUNGE	BUNGE ALIMENTOS S/A	65.5104.0004-8	Riachão das Neves	BA	Bateria de Silos	4 000	-11,2407	-46,0010	SICARM
BUNGE	BUNGE ALIMENTOS S/A	65.5104.0003-0	Riachão das Neves	BA	Graneleiro	82 100	-11,7469	-44,9063	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0023-5	Formosa do Rio Preto	BA	Graneleiro	18 600	-10,5832	-46,1603	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0019-7	Luís Eduardo Magalhães	BA	Silo	12 570	-12,1016	-46,2226	SICARM
CARGILL	CARGILL AGRICOLA SA	56.0239.0040-2	Água Boa	MT	Graneleiro	53 860	-14,0179	-52,1573	SICARM
CARGILL	CARGILL AGRICOLA SA	56.0239.0017-8	Alto Araguaia	MT	Bateria de Silos	51 050	-17,2531	-53,3175	SICARM
CARGILL	CARGILL AGRICOLA SA	56.0239.0013-5	Balsas	MA	Graneleiro	20 701	-7,5151	-46,0555	SICARM
CARGILL	CARGILL AGRICOLA SA	56.0239.0005-4	Balsas	MA	Graneleiro	19 933	-7,5154	-46,0556	SICARM
CARGILL	CARGILL AGRICOLA SA	56.0239.0007-0	Balsas	MA	Silo	2 184	-7,5156	-46,0561	SICARM
CARGILL	CARGILL AGRICOLA SA	39.0239.0013-5	Barreiras	BA	Graneleiro	94 000	-12,1198	-45,0908	SICARM
CARGILL	CARGILL AGRICOLA SA	39.0239.0003-8	Barreiras	BA	Graneleiro	36 240	-12,1174	-44,9984	SICARM
CARGILL	CARGILL AGRICOLA SA	39.0239.0002-0	Barreiras	BA	Graneleiro	31 440	-11,0698	-46,2822	SICARM
CARGILL	CARGILL AGRICOLA SA	39.0239.0012-7	Barreiras	BA	Graneleiro	8 600	-12,1198	-45,0908	SICARM
CARGILL	CARGILL AGRICOLA SA	39.0239.0004-6	Campo Novo do Parecis	MT	Graneleiro	37 630	-13,3950	-57,5333	SICARM
CARGILL	CARGILL AGRICOLA SA	39.0239.0005-4	Campo Novo do Parecis	MT	Bateria de Silos	5 940	-13,3950	-57,5333	SICARM
CARGILL	CARGILL AGRICOLA SA	39.0239.0006-2	Campos de Júlio	MT	Graneleiro	29 140	-13,4304	-59,1559	SICARM





Company	Silos Ownership	CNPJ	Silos Municipality	Silos State	Silos Type	Capacity (k tons)	Latitude	Longitude	Source
CARGILL	CARGILL AGRICOLA SA	39.0239.0001-1	Campos Lindos	TO	Graneleiro	29 420	-8,0883	-46,6615	SICARM
CARGILL	CARGILL AGRICOLA SA	39.0239.0011-9	Formosa do Rio Preto	BA	Graneleiro	50 000	-10,5623	-45,6543	SICARM
CARGILL	CARGILL AGRICOLA SA	39.0239.0014-3	Luís Eduardo Magalhães	BA	Bateria de Silos	30 980	-12,0536	-45,4826	SICARM
CARGILL	CARGILL AGRICOLA SA	80.0239.0001-4	Riachão das Neves	BA	Bateria de Silos	37 600	-11,5582	-45,9014	SICARM
CARGILL	CARGILL AGRICOLA SA	49.0239.0003-5	Sambaíba	MA	Graneleiro	25 317	-7,6176	-45,6969	SICARM
CARGILL	CARGILL AGRICOLA SA	56.0239.0016-0	Água Boa	MT	Convencional	11 480	-14,0179	-52,0958	SICARM
CARGILL	CARGILL AGRICOLA SA	49.0239.0005-1	São Desidério	BA	Graneleiro	42 020	-12,4817	-46,0828	SICARM
CARGILL	CARGILL AGRICOLA SA	49.0239.0004-3	São Desidério	BA	Graneleiro	3 230	-12,3804	-46,0903	SICARM
CARGILL	CARGILL AGRICOLA SA	49.0239.0001-9	São Desidério	BA	Graneleiro	5 440	-12,2318	-46,0260	SICARM
CARGILL	CARGILL AGRICOLA SA	39.0239.0015-1	São Desidério	BA	Silo	840	-12,1326	-46,1526	SICARM
LDC	LOUIS DREYFUS COMPANY BRASIL S.A.	47.067.525/0143-20	Água Boa	MT	Graneleiro	60 000	-14,0372	-52,2795	Company review
LDC	LOUIS DREYFUS COMPANY BRASIL S.A.	47.067.525/0162-92	Alto Araguaia	MT	Graneleiro	180 000	-17,2441	-53,3244	Company review
ALZ GRÃOS	AMAGGI LOUIS DREYFUS ZEN-NOH GRAOS S.A.	10.962.697/0007-20	Formosa do Rio Preto	BA	Graneleiro	50 000	-10,5703	-45,6183	Company review
ALZ GRÃOS	AMAGGI LOUIS DREYFUS ZEN-NOH GRAOS S.A.	10.962.697/0016-11	Luís Eduardo Magalhães	BA	Graneleiro	60 000	-12,1061	-45,9260	Company review
ALZ GRÃOS	AMAGGI LOUIS DREYFUS ZEN-NOH GRAOS S.A.	10.962.697/0002-16	Correntina	BA	Graneleiro	60 000	-13,5156	-46,0999	Company review
ALZ GRÃOS	AMAGGI LOUIS DREYFUS ZEN-NOH GRAOS S.A.	10.962.697/0010-26	Uruçuí	PI	Graneleiro	50 000	-8,2943	-44,5462	Company review
ALZ GRÃOS	AMAGGI LOUIS DREYFUS ZEN-NOH GRAOS S.A.	10.962.697/0008-01	Balsas	MA	Graneleiro	70 000	-8,0461	-45,9983	Company review
ALZ GRÃOS	AMAGGI LOUIS DREYFUS ZEN-NOH GRAOS S.A.	10.962.697/0011-07	Figueirópolis	TO	Graneleiro	42 000	-12,1153	-49,1758	Company review





2021

Company	Silos Ownership	CNPJ	Silos Municipality	Silos State	Silos Type	Capacity (k tons)	Latitude	Longitude	Source
ADM	ADM DO BRASIL LTDA	56.9481.0014-7	Campo Novo do Parecis	MT	Convencional	57 000	-13,6600	-57,8954	Company review
ADM	ADM DO BRASIL LTDA	39.9481.0002-3	Luis Eduardo Magalhães	BA	Graneleiro	57 000	-12,1117	-45,9602	Company review
AMAGGI	AMAGGI EXPORTACAO E IMPORTACAO LTDA	77.294.254/0010-85	Campos de Júlio	MT	Fundo V	60 000	-13,42073	-59,1557	Company review
AMAGGI	AMAGGI EXPORTACAO E IMPORTACAO LTDA	77.294.254/0010-85	Campos de Júlio	MT	Silo A 200	30 000	-13,42073	-59,1557	Company review
AMAGGI	AMAGGI EXPORTACAO E IMPORTACAO LTDA	77.294.254/0007-80	Campo novo do Parecis	MT	Fundo V	60 000	-13,4019	-57,5325	Company review
AMAGGI	AMAGGI EXPORTACAO E IMPORTACAO LTDA	77.294.254/0007-80	Campo novo do Parecis	MT	Fundo V	40 000	-13,4019	-57,5325	Company review
AMAGGI	AMAGGI EXPORTACAO E IMPORTACAO LTDA	77.294.254/0007-80	Campo novo do Parecis	MT	Silo	1 800	-13,4019	-57,5325	Company review
BUNGE	BUNGE ALIMENTOS S/A	65.5104.0005-6	Baixa Grande do Ribeiro	PI	Graneleiro	29 898	-8,2416	-45,2202	SICARM
BUNGE	BUNGE ALIMENTOS S/A	49.5104.0008-9	Balsas	MA	Bateria de Silos	39 780	-7,5163	-46,0704	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0032-4	Barreiras	BA	Graneleiro	24 000	-11,4950	-46,1604	SICARM
BUNGE	BUNGE ALIMENTOS S/A	56.5104.0047-2	Campo Novo do Parecis	MT	Graneleiro	44 720	-13,6172	-57,9011	SICARM
BUNGE	BUNGE ALIMENTOS S/A	56.5104.0048-0	Campos de Júlio	MT	Graneleiro	47 830	-13,7039	-59,2631	SICARM
BUNGE	BUNGE ALIMENTOS S/A	80.5104.0005-0	Campos Lindos	TO	Bateria de Silos	12 823	-8,0895	-46,6595	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0016-2	Correntina	BA	Bateria de Silos	37 720	-13,5618	-46,1129	SICARM
BUNGE	BUNGE ALIMENTOS S/A	65.5104.0004-8	Currais	PI	Graneleiro	30 229	-8,7975	-44,6289	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0041-3	Formosa do Rio Preto	BA	Graneleiro	50 000	-10,5561	-45,6078	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0025-1	Luis Eduardo Magalhães	BA	Graneleiro	790	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0007-3	Luis Eduardo Magalhães	BA	Graneleiro	95 120	-12,0931	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0022-7	Luis Eduardo Magalhães	BA	Graneleiro	95 120	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0023-5	Luis Eduardo Magalhães	BA	Graneleiro	95 120	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0024-3	Luis Eduardo Magalhães	BA	Graneleiro	85 270	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0026-0	Luis Eduardo Magalhães	BA	Bateria de Silos	69 250	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0027-8	Luis Eduardo Magalhães	BA	Bateria de Silos	41 880	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0029-4	Luis Eduardo Magalhães	BA	Bateria de Silos	21 250	-12,0934	-46,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0030-8	Luis Eduardo Magalhães	BA	Silo	20 430	-12,1114	-46,2971	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0033-2	Luis Eduardo Magalhães	BA	Silo	12 600	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0034-0	Luis Eduardo Magalhães	BA	Silo	5 470	-12,0934	-45,8172	SICARM





2021

Company	Silos Ownership	CNPJ	Silos Municipality	Silos State	Silos Type	Capacity (k tons)	Latitude	Longitude	Source
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0035-9	Luis Eduardo Magalhães	BA	Graneleiro	1 330	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0046-4	Luis Eduardo Magalhães	BA	Graneleiro	2 870	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0028-6	Luis Eduardo Magalhães	BA	Silo	1 480	-12,0934	-45,8172	SICARM
BUNGE	BUNGE ALIMENTOS S/A	80.5104.0001-7	Pedro Afonso	TO	Silo	16 064	-9,0084	-48,1682	SICARM
BUNGE	BUNGE ALIMENTOS S/A	80.5104.0003-3	Porto Nacional	TO	Graneleiro	29 680	-10,6779	-48,3915	SICARM
BUNGE	BUNGE ALIMENTOS S/A	49.5104.0005-4	Riachão	MA	Silo	13 000	-7,4404	-46,3350	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0045-6	Riachão das Neves	BA	Bateria de Silos	48 000	-11,3202	-45,5516	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0037-5	São Desidério	BA	Bateria de Silos	39 810	-12,7641	-45,9439	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0038-3	São Desidério	BA	Graneleiro	46 000	-12,7641	-45,9439	SICARM
BUNGE	BUNGE ALIMENTOS S/A	65.5104.0003-0	Uruçuí	PI	Bateria de Silos	26 366	-8,2859	-44,5719	SICARM
BUNGE	BUNGE ALIMENTOS S/A	65.5104.0001-3	Uruçuí	PI	Graneleiro	99 418	-7,3781	-44,3960	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0040-5	Formosa do Rio Preto	BA	Graneleiro	50 000	-11,4467	-46,3979	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0021-9	Formosa do Rio Preto	BA	Graneleiro	70 000	-11,0105	-46,1623	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0039-1	São Desidério	BA	Graneleiro	53 240	-13,1849	-46,0323	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0020-0	Riachão das Neves	BA	Graneleiro	186 000	-11,5674	-46,0043	SICARM
BUNGE	BUNGE ALIMENTOS S/A	65.5104.0006-4	Santa Filomena	PI	Bateria de Silos	31 780	-9,0890	-45,6728	SICARM
BUNGE	BUNGE ALIMENTOS S/A	48.5104.0028-5	Cristalina	GO	Silo	35 810	-16,8758	-47,6775	SICARM
BUNGE	BUNGE ALIMENTOS S/A	39.5104.0031-6	Luis Eduardo Magalhães	BA	Silo	13 500	-12,1725	-46,3728	SICARM
CARGILL	CARGILL AGRICOLA SA	56.0239.0016-0	Água Boa	MT	Graneleiro	53 860	-14,0179	-52,1573	SICARM
CARGILL	CARGILL AGRICOLA SA	56.0239.0040-2	Alto Araguaia	MT	Bateria de Silos	51 050	-17,2531	-53,3175	SICARM
CARGILL	CARGILL AGRICOLA SA	49.0239.0001-9	Balsas	MA	Graneleiro	20 700	-7,5151	-46,0555	SICARM
CARGILL	CARGILL AGRICOLA SA	49.0239.0004-3	Balsas	MA	Graneleiro	19 930	-7,5154	-46,0556	SICARM
CARGILL	CARGILL AGRICOLA SA	49.0239.0005-1	Balsas	MA	Silo	2 180	-7,5156	-46,0561	SICARM
CARGILL	CARGILL AGRICOLA SA	39.0239.0006-2	Barreiras	BA	Graneleiro	94 000	-12,1198	-45,0908	SICARM
CARGILL	CARGILL AGRICOLA SA	39.0239.0004-6	Barreiras	BA	Graneleiro	36 240	-12,1174	-44,9984	SICARM
CARGILL	CARGILL AGRICOLA SA	39.0239.0005-4	Barreiras	BA	Graneleiro	31 440	-11,0698	-46,2822	SICARM
CARGILL	CARGILL AGRICOLA SA	39.0239.0014-3	Barreiras	BA	Graneleiro	8 600	-12,1198	-45,0908	SICARM
CARGILL	CARGILL AGRICOLA SA	56.0239.0005-4	Campo Novo do Parecis	MT	Graneleiro	37 630	-13,3950	-57,5333	SICARM
CARGILL	CARGILL AGRICOLA SA	56.0239.0007-0	Campo Novo do Parecis	MT	Bateria de Silos	5 940	-13,3950	-57,5333	SICARM
CARGILL	CARGILL AGRICOLA SA	56.0239.0013-5	Campos de Júlio	MT	Graneleiro	29 140	-13,4304	-59,1559	SICARM
CARGILL	CARGILL AGRICOLA SA	80.0239.0001-4	Campos Lindos	TO	Graneleiro	29 420	-8,0883	-46,6615	SICARM





Company	Silos Ownership	CNPJ	Silos Municipality	Silos State	Silos Type	Capacity (k tons)	Latitude	Longitude	Source
CARGILL	CARGILL AGRICOLA S.A.	39.0239.0015-1	Formosa do Rio Preto	BA	Graneleiro	50 000	-10,5623	-45,6543	SICARM
CARGILL	CARGILL AGRICOLA SA	39.0239.0001-1	Luis Eduardo Magalhães	BA	Bateria de Silos	30 980	-12,0536	-45,4826	SICARM
CARGILL	CARGILL AGRICOLA SA	39.0239.0011-9	Riachão das Neves	BA	Bateria de Silos	37 600	-11,5582	-45,9014	SICARM
CARGILL	CARGILL AGRICOLA SA	49.0239.0003-5	Sambaíba	MA	Graneleiro	25 317	-7,6176	-45,6969	SICARM
CARGILL	CARGILL AGRICOLA SA	39.0239.0013-5	São Desidério	BA	Graneleiro	47 860	-12,7620	-45,9515	SICARM
COFCO	COFCO INTERNATIONAL BRASIL S.A	80.A873.0001-0	Santa Rosa do Tocantins	TO	Graneleiro	54 080	-11,4572	-48,0831	SICARM
LDC	LOUIS DREYFUS COMPANY BRASIL S.A.	47.067.525/0143-20	Água Boa	MT	Graneleiro	60 000	-14,0372	-52,2795	Company review
LDC	LOUIS DREYFUS COMPANY BRASIL S.A.	47.067.525/0162-92	Alto Araguaia	MT	Graneleiro	180 000	-17,2441	-53,3244	Company review
ALZ GRÃOS	AMAGGI LOUIS DREYFUS ZEN-NOH GRAOS S.A.	10.962.697/0007-20	Formosa do Rio Preto	BA	Graneleiro	50 000	-10,5703	-45,6183	Company review
ALZ GRÃOS	AMAGGI LOUIS DREYFUS ZEN-NOH GRAOS S.A.	10.962.697/0016-11	Luis Eduardo Magalhães	BA	Graneleiro	60 000	-12,1061	-45,9260	Company review
ALZ GRÃOS	AMAGGI LOUIS DREYFUS ZEN-NOH GRAOS S.A.	10.962.697/0002-16	Correntina	BA	Graneleiro	60 000	-13,5156	-46,0999	Company review
ALZ GRÃOS	AMAGGI LOUIS DREYFUS ZEN-NOH GRAOS S.A.	10.962.697/0010-26	Uruçuí	PI	Graneleiro	50 000	-8,2943	-44,5462	Company review
ALZ GRÃOS	AMAGGI LOUIS DREYFUS ZEN-NOH GRAOS S.A.	10.962.697/0008-01	Balsas	MA	Graneleiro	70 000	-8,0461	-45,9983	Company review
ALZ GRÃOS	AMAGGI LOUIS DREYFUS ZEN-NOH GRAOS S.A.	10.962.697/0011-07	Figueirópolis	TO	Graneleiro	42 000	-12,1153	-49,1758	Company review
ALZ GRÃOS	AMAGGI LOUIS DREYFUS ZEN-NOH GRAOS S.A.	10.962.697/0017-00	Porto Nacional	TO	Graneleiro	110 000	-10,2326	-48,5602	Company review

## APPENDIX 2:

# SOY TRADER REPORTING SOURCES CONSULTED

In addition to company webpages focused on zero deforestation and soy, we reviewed the following company publications.

### ADM

- Policy to Protect Forests, Biodiversity and Communities
- ADM Commitment to No Deforestation, H2 2020 Soy Action Plan
- ADM Commitment to No Deforestation, H2 2020 Soy Progress Report
- ADM's Commitment to Protecting Forests, Biodiversity and Communities, H1 2021 Soy Progress Report
- 2020 Corporate Sustainability Report: Local Action Global Impact
- ADM Grievances and Resolutions – Background
- Managing Supplier Non-Compliance
- SCF Field data from 2020 report

### ALZ GRÃOS

- Socioenvironmental Policy
- Grain Sustainability Policy

### AMAGGI

- Global Sustainability Positioning Towards a Deforestation and Native Vegetation Conversion Free Chain – 2019
- Towards a Deforestation and Native Vegetation Conversion Free Grain Chain - 2021
- Sustainability Report 2020
- 2020 Progress Report Commitment “Towards a Deforestation and Native Vegetation Conversion Free Grain Chain”
- Sustainability Bond Framework December – 2020
- Reporting Channel

### BUNGE

- Commitment to Sustainable Value Chains: Grains & Oilseeds
- Non-Deforestation Commitment – Global Sustainability Report
- Non-Deforestation Policy Grains & Oilseeds Progress Report #9 – October 2020
- Soy from South America – Progress Report #10
- 2021 Global Sustainability Report
- SCF Field data from 2020 report

### CARGILL

- Cargill Policy on Forests
- Cargill Policy on Sustainable Soy – South American Origins
- Cargill South American Soy Action Plan – June 2019
- South American Soy Progress Report 2020
- South American Soy Sustainability Report 2021 Mid-year update
- Cargill Soy Grievance Process – March 2020
- SCF Field data from 2020 report

### COFCO INTERNATIONAL

- Environmental Policy – 2019
- Sustainable Soy Sourcing Policy - 2019
- Supplier Code of Conduct
- Supplier Code of Conduct and commodity specific policies
- Sustainability Report 2020
- SCF Field data from 2020 report

### GAVILON

- N/A – no documents found

### LDC

- Soy Sustainability Policy
- Soy Sustainability – Focus on Brazil, Argentina and Paraguay
- Responsible Supply Chain – Sustainable Soy website
- Re:viewing Sustainability: Sustainability Report 2020
- SCF Field data from 2020 report

### VITERRA

- Soy sustainability policy for South America
- Glencore Supplier Standards
- Sustainability report 2020
- SCF Field data from 2020 report

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