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# Deforestation Risk in the Brazilian Soy Supply Chain

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Emerging Markets  
Investors Alliance  
Actionable Intelligence for Responsible Investing



This brief is a collaborative effort of the **Emerging Markets Investors Alliance** (the "Alliance") and **Proforest**, as part of the Soy Toolkit. The **Soy Toolkit** is a capacity building programme presented in the format of a user-friendly guide to the many existing tools, initiatives and approaches that companies can use to decouple soy sourcing from deforestation, conversion of natural habitats and human rights violations.

**Authors:** Nadine Cavusoglu (Alliance), Pedro Amaral (Proforest)

**With contributions from:** Andrew Howell (Alliance), Jane Lino (Proforest), Thais Aleluia (AllianceBernstein) and Ted Mann (AllianceBernstein)

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## DEFORESTATION RISK IN THE BRAZILIAN SOY SUPPLY CHAIN

This brief was prepared to help investors understand, identify and address Brazilian soy-related deforestation risks in their portfolios. This report is divided into four sections:

- **Overview:** This section provides an overview of soy's extensive presence in the food supply chain, Brazil's status in the global soy trade, the Brazil Forest Code (the main law to preserve native vegetation in rural properties), and the various voluntary commitments and initiatives that aim to reduce soy-related deforestation and native vegetation conversion.
- **Risks and Best Practices:** This section summarises the risks that companies (and consequently their investors) in the soy supply chain face and provides investors with a set of best practices that can help them assess the degree to which a portfolio company is exposed to soy-related deforestation risk. Links to scorecard platforms and databases that analyse and score many of the important players in the soy spectrum are also included.
- **Questions for Portfolio Companies:** This section lists suggested questions for investors to ask as part of their due diligence of, and engagement with, portfolio companies in the soy supply chain.
- **Resources:** This section points to existing resources to help portfolio companies manage deforestation and human rights risks in their soy supply chains. Some resources will help companies evidence that soy purchased is not associated with issues, while some resources allow them to flag and resolve issues whenever they are found.

## KEY TAKEAWAYS

- The boom in the livestock industry – where 75% of soy<sup>1</sup> is used as feedstock – has led to rapid growth in global soy production. Most of this growth in production has come from South America, where part of the land cultivation has expanded into forests, savannahs and grasslands.
  - Brazil overtook the United States as the world's largest soy producer in the 2019/2020 crop year after growing its soy production 78%<sup>2</sup> in the last decade. Brazil is also the largest exporter of soy globally, commanding 56% of the soybean trade and 25% of the soymeal trade. China and the European Union are the largest importers of Brazilian soy and soymeal respectively.<sup>7</sup>
  - Soy is considered by some research the second largest driver of deforestation globally<sup>3,4</sup>. Half of Brazil's soy production comes from the Amazon and Cerrado biomes, two of the most threatened biomes in the world. The deforestation cycle includes drivers such as land speculation, land grabbing or illegal lodging, on top of commodity production – which might end up happening on land cleared initially due to other drivers.
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## Deforestation Risk in the Brazilian Soy Supply Chain

- Companies in the soy supply chain are exposed to reputational, market, regulatory and operational risks stemming from the adverse environmental and social impacts of deforestation-linked soy. Furthermore, many downstream companies have zero-deforestation and conversion-free supply chain commitments that go beyond legal requirements. This exposes upstream companies to further market risk.
- Given the ubiquitous nature of soy as an ingredient in the food supply chain, investors can be exposed to these risks not only through their holdings of grain producers and traders, but also through animal protein producers, food manufacturers, supermarkets and restaurant chains. Therefore, they should ensure best practices to manage these risks are being adopted across their portfolio companies.

## 1. OVERVIEW

### 1.1 SOY AND THE FOOD SUPPLY CHAIN

The soybean is widely grown for its edible bean, which has numerous uses. Some food uses include obvious products such as soymilk, tofu, soy sauce and soy oil and less evident products, as soy lecithin which is used in chocolate. However, the increased demand for soy has been primarily driven by the meat and dairy industries since most of the world’s soy ends up as animal feed.

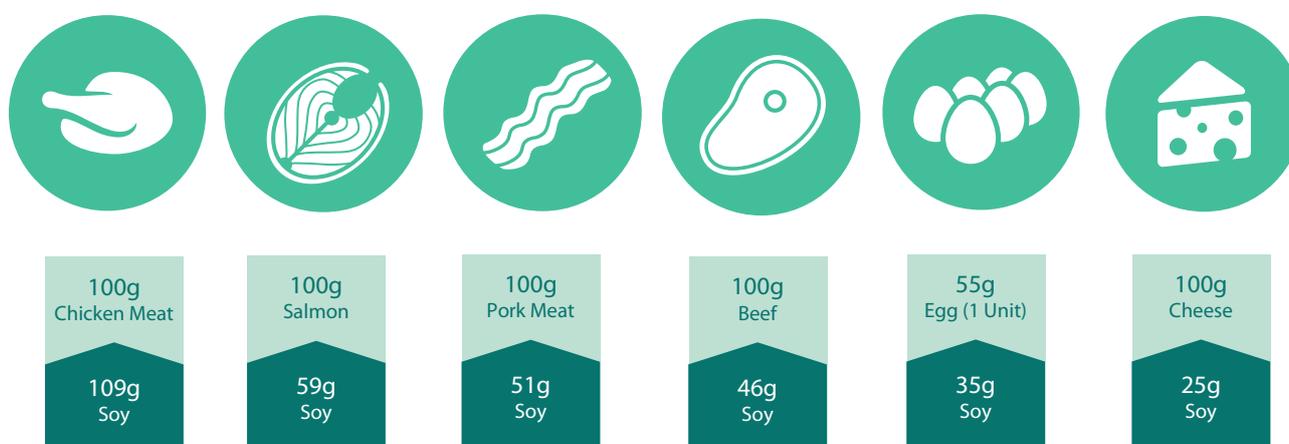
The global production of soy has rapidly grown from 27 million tons in 1961 to 349 million tons in 2018<sup>5</sup>. Global soybean production is highly concentrated, with about 81% originating from three countries alone: The United States, Brazil and Argentina (Table 1).

Soy is exported in different ways. Most of soy exported as soybean is from Brazil, which accounted for 56% of global trade, with the US responsible for 29% of global trade. Soybean meal is mostly exported from Argentina, which accounts for 34% of global exports, followed by Brazil (25%), and the US (15%). Soybean oil is exported mostly from Argentina, which accounts for 33% of global exports, followed by Brazil (12%), the US (10%) and Paraguay (5%)<sup>7</sup>.

Despite being a key component of human meals, soy remains largely hidden in human diets. Soy is mostly used in poultry and pig feed, but it is also used in other animal feed, including feed for cattle, lambs and fish (Figure 1).

**Table 1: Top Soybean producers 2019/2020<sup>6</sup>**

Country	Million metric tons
Brazil	124.0
USA	96.7
Argentina	50.0
China	18.1
Paraguay	9.9
India	9.3
<b>World</b>	<b>335.5</b>



**Figure 1: Hidden soy in human diets: an estimate of the amount of soy used to produce each product<sup>8</sup>**

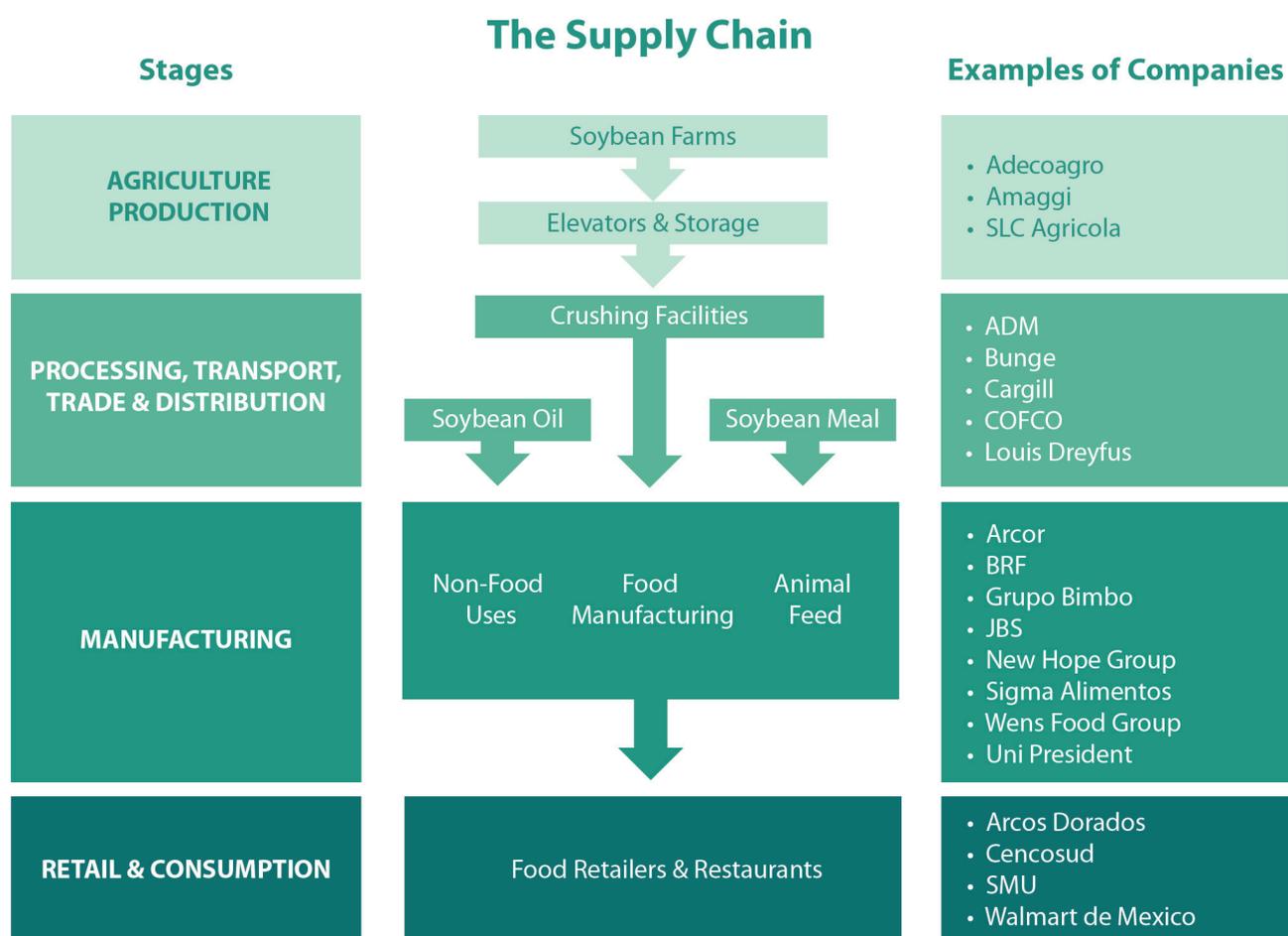
In Brazil, soy is an important input for pork and poultry operations. Cattle raised for beef production in Brazil is mostly grass-fed, and in fattening confinements, increasingly the beef sector has been using by-products from other sectors (sugarcane bagasse, citrus pulp and cottonseed). Brazil is the leading poultry meat exporter, accounting for 22.4% of global exports (Table 2), and accounts for 3.8% of global pork meat exports (Table 3).

**Table 2: Top Poultry Meat exporters (2018)<sup>9</sup>**

Country	Billion USD
Brazil	6.0
USA	3.6
Poland	2.7
Netherlands	2.7
Germany	1.1
France	1.0
Hong Kong	1.0
Belgium-Luxembourg	0.9
Thailand	0.7
Hungary	0.7
<b>World</b>	<b>27.0</b>

**Table 3: Top Pork Meat exporters (2018)<sup>10</sup>**

Country	Billion USD
USA	4.5
Germany	4.4
Spain	4.0
Denmark	2.6
Canada	2.4
Netherlands	2.1
Belgium	1.4
Brazil	1.1
Poland	1.0
France	0.9
<b>World</b>	<b>28.0</b>



**Figure 2: Simplified Soy Supply Chain and Example of Companies Operating in Emerging Markets<sup>11</sup>**

## 1.2 SOYBEAN PRODUCTION IN BRAZIL

Brazil is projected to retain its top soybean producing country ranking for the 2020/2021 crop season<sup>12</sup>. Brazil is also where more than a third of the total tropical forest loss in 2019 happened<sup>13</sup>. Several studies associate part of the native vegetation loss in Brazil to crop production and cattle raising<sup>4</sup>.

The main soybean producing states in Brazil are Mato Grosso, Paraná and Rio Grande do Sul (Table 4). Mato Grosso State has parts of its territory occupied by the Amazon and by the Cerrado biomes. The Cerrado biome also covers parts of other producing states, being responsible for half of soy production in Brazil and where soy production has been expanding the most in recent years.

Recent research indicates that most of the deforestation in 2019 in Brazil was not authorised or happened in areas protected by law, which indicates that most of it was illegal<sup>15</sup>. Particularly in the State of Mato Grosso (Figure 3), recent research indicates that over a quarter (27%) of the total deforestation in 2012-2017 took place on soy farms. The same research points that *80% of the illegal deforestation on soy farms took place on just 400 farms, which represents only 2% of all the soy farms in the state*<sup>16</sup>.

This indicates that the larger fraction of soy producing farms were not associated with illegal deforestation in the period analysed. However, there are still many farms associated with illegal deforestation. Being able to scrutinise the soy supply chain is critical to differentiate if soy entering a supply chain is coming from such farms or not.

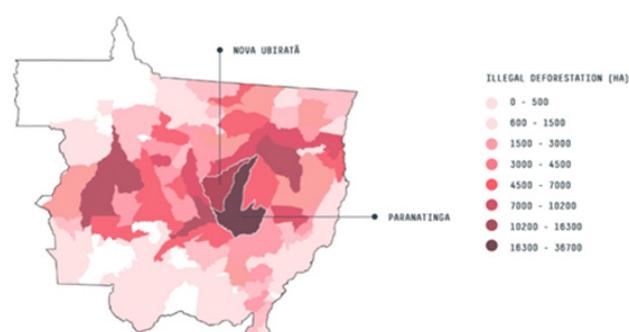
This can be particularly concerning from a buying company’s standpoint, since under Brazilian legislation financial institutions and companies procuring commodities can be held jointly accountable for environmental damage arising from activities either financed by them or by their suppliers. These institutions are liable if they fail to verify commodity suppliers’ compliance with environmental laws and regulations when providing credit or entering into contracts<sup>17</sup>.

On top of that, many companies in different stages of the soy supply chain have pledged not to buy soy associated with deforestation or native vegetation conversion<sup>18</sup>, be it legal or illegal. Some of these commitments were made collectively, such as in the Consumer Goods Forum<sup>19</sup> or the New York Declaration on Forests<sup>20</sup>, whereas others were made individually – most of them do not accept any type of deforestation after a given date. The Amazon biome has historically been the focus of many companies’ commitments. Nonetheless, increasingly the Cerrado biome is being addressed by such commitments. Nearly 140 global companies and institutional investors are signatories of Cerrado Manifesto Statement of Support<sup>21,22</sup>.

The pledges and companies’ commitments vary, but usually they include mention of sourcing from farms where the law is complied with (or not being found to be breaching it), where there has been no deforestation or native vegetation conversion (illegal or legal) after a given date (known as cut-off date) and where human rights are respected. In Brazil the Forest Code, the federal law for protection of native vegetation in rural properties, protects to some extent native vegetation but allows part of it to be legally converted.

**Table 4:** Top soy producing States in Brazil<sup>14</sup>

State	Million metric tons
Mato Grosso	32
Paraná	19
Rio Grande do Sul	18
Goiás	11
Mato Grosso Sul	10
Bahia	6
Minas Gerais	5
São Paulo	3
Maranhão	3
Tocantins	3



**Figure 3:** Illegal deforestation (ha) on soy farms per municipality in Mato Grosso<sup>16</sup>

### 1.3 BRAZIL'S FOREST CODE

The **Brazil Forest Code** (Law 12651/2012) is the main law governing the protection of native vegetation in private properties. The main obligations established by the Forest Code are<sup>23</sup>:

- **Rural Environmental Registry:** An electronic register of georeferenced information about a rural property, including property perimeters.
- **Permanent Preservation Areas:** Protected areas, covered or not by native vegetation, with the environmental role of preserving, amongst other things, water resources, landscapes, geological stability, biodiversity. Examples are riparian zones, springs, hilltops, steep slopes and mangroves.
- **Legal Reserves:** Areas in a rural property to protect native vegetation and ensure the sustainable economic use of the property's natural resources, promote biodiversity conservation, and provide shelter and protection to wildlife.

Depending where the property is located, the area to be preserved as Legal Reserves varies from 20% to 80% of the property (Figure 4).

In the Legal Amazon, if the property is an area originally with prevalence of forest, 80% needs to be preserved as Legal Reserve. If in the Legal Amazon but in the Cerrado Biome, then 35% of the land needs to be preserved as Legal Reserve. If anywhere else in the country, including in states in the Cerrado but not part of the Legal Amazon, then the percentage to be protected falls to 20% - meaning that 80% of the land can be legally converted, provided the permits are in place, otherwise the conversion is illegal.

Type of vegetation	Legal Amazon			Rest of Brazil
	Forest	Cerrado	Grasslands	
Legal reserve	80%	35%	20%	20%

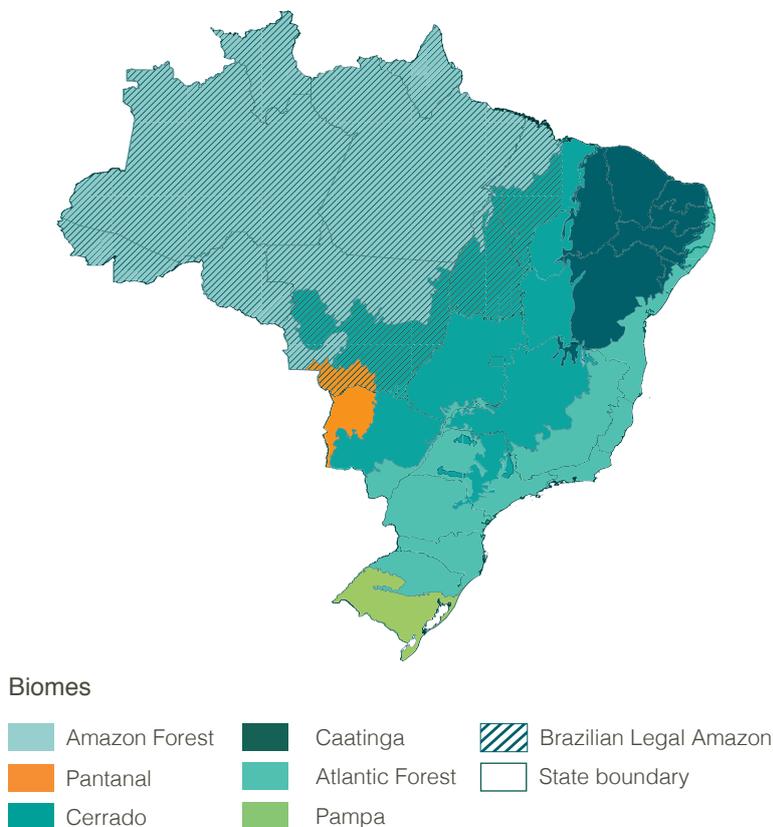


Figure 4: Percentage of Legal Reserve required by the Forest Code<sup>23</sup>

## Deforestation Risk in the Brazilian Soy Supply Chain

To ensure compliance with the Forest Code, every single farm needs to be enrolled in the Rural Environmental Registry. Using the registration number, **companies buying soy (and other commodities) directly from the farmer can verify the environmental status** of the property in the **Public Inquiry Module of the Rural Environmental Registry System** (Figure 5).

Most of the farms in the country are already enrolled. Once a farm is enrolled, State-level environmental agencies analyse and validate the registries, thus indicating if the farm is fully compliant or if actions should be taken – e.g. restoring part of the native vegetation. There is not a deadline for enrollment but the final deadline to be fully compliant with the law is May 28th, 2032<sup>23</sup>.

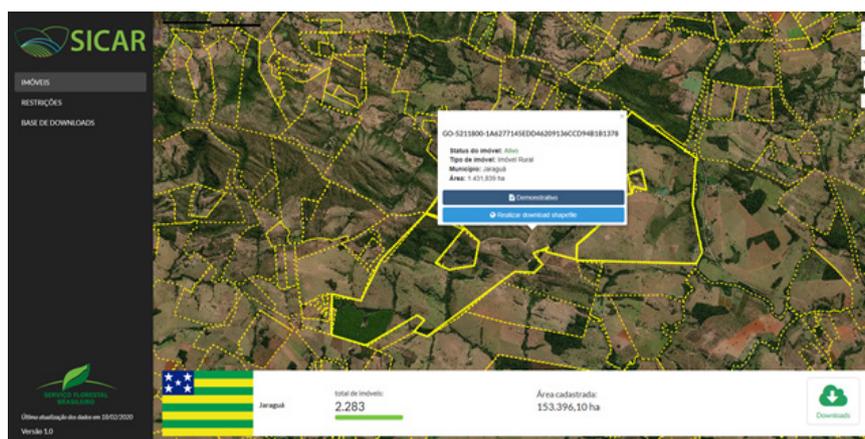


Figure 5: Snapshot of the Rural Environmental Registry System<sup>24</sup>

## 1.4 CHECKING ADDITIONAL LEGAL, NO-DEFORESTATION AND HUMAN RIGHTS REQUIREMENTS AT FARM-LEVEL

In addition to the Rural Environmental Registry System, there are other platforms developed and run by federal agencies that can help companies buying commodities directly from the farmer to analyse illegalities, including: The Federal Environmental Agency (IBAMA) list of **environmental embargoes**, the Public Prosecutor’s Office **“Amazônia Protege”** website (which includes lawsuits related to environmental and social issues) and the **Forced Labour Dirty List**, which is published by the Ministry of Economy. For a comprehensive list of resources to help scrutinise soybean direct suppliers, please see the Soy Toolkit Element 4: **Incorporating Responsible Sourcing Policies in Purchase Control Systems**. There are also geospatial monitoring tools to help analyse if deforestation or conversion has happened, some of which were developed and run by federal agencies, civil society and/or acadthe Alliance. A list of these resources can be found in the Soy Toolkit Element 2B: **Soy risk analysis: Prioritisation for positive engagement**.

## 1.5 CERTIFICATION

Certification is a formal declaration regarding a certain attribute issued by a credible entity or authority. Recognised certification schemes can be useful for procuring and trading companies insofar as they offer security in regard to the legality and other aspects (e.g. zero deforestation) of the product being purchased<sup>25</sup>. There are many certification schemes pertinent to soy<sup>26</sup>, including: Roundtable on Responsible Soy (RTRS) Certification<sup>27</sup>, International Sustainability and Carbon Certification (ISCC Plus)<sup>28</sup>, and ProTerra<sup>29</sup>. These three standards were considered by recent research<sup>30</sup> as having the most provisions for the selected forest and biodiversity issues, without taking into consideration the level of assurance. Large traders like Amaggi, Cargill, ADM and Bunge also have their own Voluntary Standards Systems. Despite many standards being available, the minority of soy traded on the planet is certified. Climate Focus research indicates the total Proterra and RTRS certified volume in 2016 accounted for 2.5% of global production<sup>31</sup>.

## 1.6 AGREEMENTS AND INITIATIVES IN THE SOY SECTOR

In the past decades, several multi-stakeholder initiatives have been underway to stop soy-related deforestation. In some instances, these initiatives (e.g. The Amazon Soy Moratorium) have been instrumental in reducing deforestation and in other instances the impact on deforestation is yet to be seen. It is important for investors to be aware of these initiatives as they can play a role in shaping the risks confronting their portfolio companies with direct soy exposure. Fast-moving consumer goods companies (FMGCs) who are signatory to some of these initiatives are under increased scrutiny regarding their progress towards commitments, especially since in some instances 2020 was set as the target date for achieving zero-deforestation. Increased NGO, media and investor pressure on these companies will in turn increase pressure on their suppliers (traders, feed producers, meat processors) to provide evidence that they are not directly or indirectly associated with deforestation or human rights violations.

### AMAZON SOY MORATORIUM<sup>32</sup>

A commitment of the Brazilian Vegetable Oil Industries Association (ABIOVE) and the Brazilian Association of Cereal Exporters (ANEC) was made not to trade in or finance soy in areas that were deforested in the Amazon biome after 2008. There is an internationally credible monitoring system to help ensure deforestation-free soybeans are being traded. For **upstream companies**, it provides an internationally credible framework and monitoring system to not buy soybeans produced in deforested areas in the Amazon biome. For **downstream companies**, it provides them with a credible and easy-to-monitor framework to buy deforestation-free soy in the Amazon biome, provided they buy from traders who are signatories to it, and who fully comply with it. The framework is based on geospatial analysis and third-party audits to ensure compliance with the moratorium. Companies in the animal protein sector should commit to only sourcing soy that is compliant with the Amazon Soy Moratorium.

### STATEMENT OF SUPPORT OF THE CERRADO MANIFESTO<sup>33</sup>

This is a pledge from supply chain companies and investors for *halting forest loss associated with agricultural commodity production*, recognising the critical importance of the Cerrado Biome and committing to *working with local and international stakeholders to halt deforestation and native vegetation loss in the Cerrado*. The group has been working to create a market signal and define implementation of zero-conversion to soy and cattle in the Cerrado. The Cerrado Manifesto is a civil society-led *two-page document that puts the onus on soy and meat producers and traders, as well as other companies in the commodities supply chain, to prevent runaway destruction of the Cerrado Biome*<sup>34,35</sup>.

### CERRADO FUNDING COALITION<sup>36</sup>

The coalition *aims to provide the critical funding needed to implement a Brazilian-led innovative solution to end deforestation from soy in this biome. This funding will be used to provide the financial incentives necessary for such a solution to support farmers in the Cerrado to transition to producing soy only on existing agricultural land*. Current contributors include Tesco, Nutreco and Grieg Seafood. They see as one *such possible solution, involving payments for farmers for conservation*, for which they estimate that US\$250 million in funding is necessary, which the coalition is trying to raise.

### SOY COALITION OF ACTIONS<sup>37</sup>

This is a group of Consumer Goods Forum member companies with zero deforestation commitments *focused on making progress through specific commitments, actions and KPIs laid out in commodity-specific roadmaps for palm oil, soy and pulp, paper and packaging. The roadmaps aim to drive change by aligning action and building collaboration*. (...) The groups' expectation is to remove deforestation and conversion from soy supply chains by moving from deforestation-free supply to deforestation-free business, i.e. they would expect suppliers to have all soy sourced deemed deforestation-free, not only the fraction ending in their products. They will also work to encourage transformational change in key commodity landscapes by working cross-commodity in collaboration on integrated land use; to define common KPIs for progress and aligned communications.

There are other initiatives, including the **Amsterdam Declaration Partnership**<sup>38</sup>, the **New York Declaration on Forests**<sup>39</sup> the **Sustainable Soy Trade Platform in China**<sup>40</sup>, the **China Sustainable Meat Declaration**<sup>41</sup>, among others.

## 2. RISKS AND BEST PRACTICES

### 2.1 RISKS

Companies that do not adequately address soy-related deforestation risks in their supply chains can be exposed to legal, reputation, market and operating risks (Table 5). These can result in loss of market capitalisation or credit rating downgrades, affecting portfolio performance. Furthermore, large holdings of companies linked to deforestation that are singled out in NGO and media campaigns can also have adverse reputational consequences for the investment firm.

Risks	Drivers	Potential Impact
<b>Legal</b>	Under Brazilian legislation, buyer companies are liable if they fail to verify commodity suppliers' compliance with environmental laws and regulations when providing credit or entering into contracts.	Violation of the Brazil Forest Code or other environmental laws could lead to financial penalties to companies procuring soy.
<b>Reputation</b>	Consumer-facing food manufacturing companies, supermarkets and restaurant chains are most exposed to this risk.	Brand equity damage through adverse media and advocacy campaigns, resulting in loss of market share and capitalisation.
<b>Market</b>	Companies can lose market access and customers resulting from: 1) buyers avoiding Brazilian soy due to its perceived high deforestation risk; 2) countries and customers implementing new requirements (e.g. certification, due diligence processes, geospatial monitoring) and companies not being ready to meet them.	This can result in revenue loss to upstream companies sourcing soy from Brazil.
<b>Operating</b>	Pressure from NGO campaigns, consumers or local regulations can lead to companies being forced to source animal feed or products containing no Brazilian soy or only certified soy.	This can result in supply chain disruptions, lower output or increased production costs resulting in lower profits.

Table 5: risks and potential adverse impacts to businesses

### 2.2 BEST PRACTICES INVESTORS SHOULD LOOK FOR IN THEIR PORTFOLIO COMPANIES

When assessing if a company is well positioned or exposed to deforestation risk linked to soy in its supply chain, investors should assess the degree to which a company meets a set of best practices, which in this brief we summarise below.

For references to initiatives that help companies develop comprehensive and in-depth procurement policies for forest-risk commodities (including soy), we recommend checking [The Accountability Framework Initiative](#) and its [Regional Guidance for Advancing Deforestation-Free and Conversion-Free Beef, Leather, and Soy Supply Chains](#).

#### EXPOSURE TO DEFORESTATION RELATED TO SOY

- The company calculates the total amount of soy purchased directly or embedded in its supply chain.
- The company has high visibility of soy impacts on its supply chains, e.g. it is aware of portion of revenues/operating costs tied to soy.
- The company has identified the amount of soy procured from threatened biomes.

## POLICY COMMITMENTS<sup>42</sup>

- The company has a publicly disclosed zero-deforestation commitment that explicitly includes soy. A conversion-free commitment or a zero-deforestation/deforestation-free commitment that explicitly includes all other natural ecosystems (e.g. savannahs) would be the best coverage whereas a zero illegal deforestation policy would fall short of protecting threatened biomes such as the Cerrado.
- The policy covers the entire supply chain and sourcing geographies (e.g. it should not just include the Amazon and exclude the Cerrado).
- The company has set time-bound targets to meet its policy commitments and the target date is not too far into the future.
- The policy states explicit cut-off dates after which land units associated with deforestation are deemed non-compliant.

## SOURCING PROCEDURES

- The company uses a well-documented and transparent monitoring system and verifies compliance on a periodic basis.
- If an upstream company (producer, processor, trader), there is full traceability to the origin of the product (i.e. to the farm level when purchasing directly from the farmer, to the first aggregation point if purchasing indirectly – e.g. from a cooperative). If a downstream company (food processor, retailer), at minimum tracing it to the municipality level if coming from a higher risk region.
- The company engages with its non-compliant suppliers with a plan to bring them into compliance and in cases of continued non-compliance, as a last resort excludes, them from the supply chain.
- The company maximises purchases of certified soy whenever physically certified material is available.

## DISCLOSURE

- The company reports on progress in implementation of commitments (at least annually) using quantitative and qualitative metrics.
- Company reports percentage of soy volume (as total of soy procured) in compliance with its commitments.

Large and well-known companies are often analysed in scorecard platforms and databases that compile information in a systematic way. Some of these platforms analyse the quality of companies' commitments, how far they have been implemented and how transparent the implementation process is to stakeholders.

- **CDP** annually discloses company action on forests. The information supplied in the reporting process is scored and provides a view on a company's journey towards environmental stewardship. [cdp.net/en](https://www.cdp.net/en)
- **Forest 500**, led by Global Canopy, identifies and ranks the 500 "powerbrokers of deforestation": companies and financial institutions with the most influence over forest risk commodity supply chains. [forest500.org](https://www.forest500.org)
- **Supply Change**, led by Forest Trends, provides companies' profiles and an overview of the extent and value of commitment-driven soy production and demand. [supply-change.org](https://www.supply-change.org)

These platforms often provide some ranking or scoring systems against sustainability criteria. Scorecards are very useful to get a quick overview of, for example, the presence or absence of commitments. Companies that are not listed in scorecard platforms can be contacted directly and this should also happen if more detailed information is needed, in which case investors will need to have further analytical capacity to analyse the responses and take actions based on it.

### 3. INITIAL QUESTIONS TO ASK PORTFOLIO COMPANIES

#### POLICY RELATED

1. Do you have a zero-deforestation procurement policy for soy and other deforestation-risk commodities? If so, is it “zero gross deforestation”, “zero net deforestation” or “zero illegal deforestation”?
2. Does the policy address other types of native vegetation (e.g. savannahs and grasslands) on top of forests?
3. What is your policy cut-off date?
4. Does your policy address human rights risks (e.g. land conflicts, forced labour, labour rights)?<sup>43</sup>
5. What is the geographic scope of your policy? Does it apply to Brazil (including the Amazon and the Cerrado biomes), Argentina, Paraguay and Bolivia?
6. What is the supply chain scope of your policy? Does it apply to all company operations and to all third-party suppliers?
7. Do you have time-bound targets for achieving full compliance with your policy commitments? What are they?
8. What does your implementation plan look like? Does it explicitly mention quantifiable and time-bound targets?
9. Are you reporting publicly on progress in implementing your policy? Where are the reports available?
10. Are you a signatory to any of the relevant multi-stakeholder initiatives, moratoria or declaration?

#### BUSINESS RISK RELATED

1. Have you calculated your overall exposure to soy in terms of revenues and/or operating costs?
2. Do you have a monitoring system in place to trace the origin of soy? If so, how far down the supply chain do you track?
3. What % of soy used in your operations is sourced from Brazil?
4. Do you have a regional breakdown of soy sourced from Brazil (e.g. Amazon, Cerrado, etc.)?
5. What is the % of volume sourced from the Amazon and % compliant with the Amazon Soy Moratorium?
6. What is the % of volume sourced from the Cerrado?
7. What % of soy is sourced directly from soybean farmers vs. via indirect suppliers?
8. What percentage of soy sourced from Brazil is certified?
9. What is the % out of the total soy you purchase (in volume or mass) that is compliant with your policy?

### 4. RESOURCES

- Accountability Framework initiative. Available at: [www.accountability-framework.org](http://www.accountability-framework.org)
- Regional Guidance for Advancing Deforestation-Free and Conversion-Free Beef, Leather, and Soy Supply Chains in the Brazilian Amazon and Cerrado and the Gran Chaco of Argentina and Paraguay. Available at: [www.accountability-framework.org/resources-library/advancing-deforestation-free-and-conversion-free-supply-chains-in-brazil-argentina-and-paraguay](http://www.accountability-framework.org/resources-library/advancing-deforestation-free-and-conversion-free-supply-chains-in-brazil-argentina-and-paraguay)
- Soy Toolkit. Available at: [www.soytoolkit.net](http://www.soytoolkit.net)
- Assessing compliance with the Forest Code: a practical guide. Available at: [www.proforest.net/en/publications/assessing-compliance-with-the-forest-code-a-practical-guide](http://www.proforest.net/en/publications/assessing-compliance-with-the-forest-code-a-practical-guide)

## ENDNOTES

- 1 WWF (2019). Available at: [https://www.wwf.org.uk/sites/default/files/2019-10/WWF-UK\\_Retailers\\_Soy\\_Policies\\_October2019.pdf](https://www.wwf.org.uk/sites/default/files/2019-10/WWF-UK_Retailers_Soy_Policies_October2019.pdf)
- 2 USDA, 2020. Available at: <https://apps.fas.usda.gov/psdonline/app/index.html#/app/advQuery>
- 3 **Pendrill et al, 2019**, Deforestation displaced: trade in forest-risk commodities and the prospects for a global forest transition; **Carneiro Filho et al, 2016**, The expansion of soybean production in the Cerrado; **Henders et al, 2015**, Trading forests: land-use change and carbon emissions embodied in production and exports of forest-risk commodities; **Gasparri et al, 2014**, The Coupling of South American Soybean and Cattle Production Frontiers: New Challenges for Conservation Policy and Land Change Science; **Arima et al, 2011**, Statistical confirmation of indirect land use change in the Brazilian Amazon.
- 4 The deforestation cycle is complex and includes drivers such as land speculation, land grabbing or illegal lodging, on top of commodity production – which might end up happening on land cleared initially due to other drivers. Deforestation not only happens for commodity production, but there is a clear link with it, sometimes directly and other times indirectly
- 5 FAO 2019. Available at: <http://www.fao.org/faostat/en/#data/QC>
- 6 USDA, 2020. Table 11: Soybean Area, Yield, and Production -- Preliminary Data. Available at: <https://apps.fas.usda.gov/psdonline/circulars/production.pdf>
- 7 Observatory of Economic Complexity. Available at: <https://oec.world/>
- 8 Based on WWF (2019). Available at: [https://www.wwf.org.uk/sites/default/files/2019-10/WWF-UK\\_Retailers\\_Soy\\_Policies\\_October2019.pdf](https://www.wwf.org.uk/sites/default/files/2019-10/WWF-UK_Retailers_Soy_Policies_October2019.pdf). Several studies present conversion factors to help estimate the embedded soy in different animal protein or dairy products, including: **RTRS Soy Calculator, Soy Reporting Initiative, WWF Risky Business, Dutch Soy Barometer**.
- 9 Observatory of Economic Complexity. Available at: <https://oec.world/en/profile/hs92/poultry-meat>
- 10 Observatory of Economic Complexity. Available at: <https://oec.world/en/profile/hs92/pig-meat>
- 11 Based on CERES. Available at: <https://engagethechain.org/soybeans>
- 12 USDA, 2020. Available at: <https://apps.fas.usda.gov/psdonline/circulars/production.pdf>
- 13 The New York Times, 2020. Available at: <https://www.nytimes.com/2020/06/02/climate/deforestation-climate-change.html>
- 14 Data refers to 2018. Source: Brazilian Institute of Geography and Statistics, 2020. Available on: <https://sidra.ibge.gov.br/tabela/1612#resultado>
- 15 Mapbiomas, 2020. Available at: [http://alerta.mapbiomas.org/en/relatorios?cama\\_set\\_language=en](http://alerta.mapbiomas.org/en/relatorios?cama_set_language=en)
- 16 Trase, Imaflora, ICV, 2020. Available at: [http://resources.trase.earth/documents/issuebriefs/TraseIssueBrief4\\_EN.pdf](http://resources.trase.earth/documents/issuebriefs/TraseIssueBrief4_EN.pdf)
- 17 The regulatory basis for holding procuring companies and financial institutions jointly responsible for non-compliance with environmental laws their supply chain and financed activities is derived from:  
Federal Constitution of 1988 - Articles 192 and 225  
National Environmental Policy - Law 6938/1981 - Articles 3, Item IV (definition of a polluter); 12 (liability of financial institutions); 14, Item I (civil, criminal and administrative liability of polluters)  
Environmental Crimes Law - Law 9605/1998 - Article 2, Environmental liability for monitoring and joint responsibility  
Federal Decree 6514/2008 - Administrative breaches and sanctions related to the environment.
- 18 The latter also addresses other types of native vegetation beyond forests, including savannahs and grasslands. .
- 19 CGF, 2017. Available at: <https://www.theconsumergoodsforum.com/implementing-and-scaling-up-the-cgf-zero-net-deforestation-commitment/>
- 20 New York Declaration on Forests. Available at: <https://forestdeclaration.org/about/>
- 21 See the Cerrado Manifesto Statement of Support. Available at: <https://cerradostatement.fairr.org/>
- 22 Apart from expanding the commitments to the Cerrado, supply chain companies have also been updating the wording on their commitments, so they address not only forest, but also other types of native vegetation, including savannah and grassland. The Cerrado is a mosaic of different types of native vegetation, including forests, savannahs and grassland.

- 23** Proforest, IPAM, BVRio, 2017. Assessing compliance with the Forest Code: a practical guide. Available at: <https://www.proforest.net/en/publications/assessing-compliance-with-the-forest-code-a-practical-guide>
- 24** Serviço Florestal Brasileiro, 2020. Available at: <http://www.car.gov.br/publico/imoveis/index>
- 25** Provided the certification is not “book and claim/credits”, but rather physical certification of soy being procured.
- 26** IDH, IUCN, European Soy Monitor, 2019.
- 27** Roundtable on Responsible Soy. Available at: <https://www.responsiblesoy.org/certification/nuestra-certificacion/?lang=en>
- 28** ISCC Plus. Available at: <https://www.iscc-system.org/>
- 29** ProTerra Foundation. Available at: <https://www.proterrafoundation.org/>
- 30** Profundo, 2019. Available at: [https://www.iucn.nl/files/publicaties/setting\\_the\\_bar\\_for\\_deforestation\\_free\\_soy\\_190606\\_final.pdf](https://www.iucn.nl/files/publicaties/setting_the_bar_for_deforestation_free_soy_190606_final.pdf)
- 31** Climate Focus, 2019. Available at: [https://irp-cdn.multiscreensite.com/be6d1d56/files/uploaded/Sustainability%20in%20Soy%20supply%20chain\\_consolidated%20study%20%282%29\\_final.pdf](https://irp-cdn.multiscreensite.com/be6d1d56/files/uploaded/Sustainability%20in%20Soy%20supply%20chain_consolidated%20study%20%282%29_final.pdf)
- 32** ABIOVE. Available at: <https://abiove.org.br/en/sustainability/>
- 33** FAIRR. Available at: <https://cerradostatement.fairr.org/>
- 34** For more information, please see: [https://www.wwf.org.br/natureza\\_brasileira/areas\\_prioritarias/cerrado/manifestodocerrado/cerrado\\_conversion\\_zero/](https://www.wwf.org.br/natureza_brasileira/areas_prioritarias/cerrado/manifestodocerrado/cerrado_conversion_zero/)
- 35** <https://news.mongabay.com/2018/08/more-companies-sign-on-to-cerrado-manifesto/>
- 36** Cerrado Funding Coalition. Available at: <https://www.cerradofundingcoalition.com/>
- 37** The Consumer Goods Forum. Available at: <https://www.theconsumergoodsforum.com/environmental-sustainability/forest-positive/>
- 38** Amsterdam Declarations Partnership. Available at: <https://ad-partnership.org/>
- 39** New York Declaration on Forests. Available at: <https://forestdeclaration.org/>
- 40** Solidaridad. Available at: <https://www.solidaridadnetwork.org/news/first-steps-towards-responsible-soy-sourcing-guidelines-for-china>
- 41** WWF. Available at: <https://www.wwf.org.br/?61882/China-Meat-Association-And-Its-64-Chinese-Company-Members-Jointly-Announce-Chinese-Sustainable-Meat-Declaration-with-WWF>
- 42** The Accountability Framework Initiative (AFi) provides companies with guidance to establish policy commitments pertinent deforestation-risk commodities. Investors can point the AFi as a reference for the portfolio companies. More information available at: <https://accountability-framework.org/>
- 43** Note: the recommendation is that procurement policies not only focus on environmental issues, but also human rights issues that could be happening at production-level, including forced labour, poor labour practices or land conflicts.

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