Illegal deforestation and Brazilian soy exports: the case of Mato Grosso

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This brief, developed in partnership with Imaflora and ICV, draws on official data to estimate the amount of illegal deforestation taking place on soy farms in Mato Grosso, the state that exports the most soy from Brazil. It also assesses the exposure of global markets to soy from farms where illegal deforestation has taken place between 2012 and 2017.

KEY FINDINGS

- *Over one quarter (27%) of the total deforestation in Mato Grosso (2012–2017) took place on soy farms.*
- *95% of the deforestation on soy farms was illegal under Brazilian regulations because the necessary licences were not in place.*
- *80% of the illegal deforestation on soy farms took place on just 400 farms, which represents just 2% of the total number of soy farms in the state. These farms are mostly large properties (73%).*
- *Over 80% of the soy produced on farms where illegal deforestation took place is estimated to be exported to global markets – 46% to China and 14% to the EU.*
- *Nearly a quarter of China's soy imports from Brazil came from Mato Grosso in 2018, and 21% of these imports were likely to have come from farms where illegal deforestation had taken place.*
- *Around one third of the EU's soy imports from Brazil came from Mato Grosso in 2018, and just under 20% of these imports were likely to have come from farms where illegal deforestation had taken place.*

SOY HARVEST | PHOTO: RODRIGO VARGAS, ICV

INTRODUCTION

Almost half of all tropical deforestation between 2000 and 2012 resulted from the illegal conversion of forests for commercial agriculture[1]. In Brazil, a new report published in May 2020 by Mapbiomas found that 99% of the deforestation in 2019 was likely to be illegal[2].

The Brazilian Forest Code allows limited deforestation to occur legally on private land, but land owners must first obtain a deforestation licence from the government. The licensing process is a critical step in guaranteeing compliance with the law and achieving sustainable land use, including by limiting deforestation and reducing its impact. In order to receive a licence, applicants must fulfil several requirements, such as proving that there are no abandoned areas within the farm, carrying out field surveys for threatened species, and adopting compensatory measures when threatened species are present. Any deforestation that occurs without a licence is therefore illegal under Brazilian law.

Deforestation has direct negative impacts for biodiversity and for the climate, and illegal deforestation means that these impacts are not managed. Illegal deforestation can also have social impacts, including increased land conflicts, violence and crimes against environmental defenders and infringements of local communities' rights[3,4].

Illegally clearing native vegetation also has an economic cost, with potential impacts on trade. For instance, the EU-Mercosur trade deal, which is expected to increase Brazil's exports and imports by over US$ 250 billion was put at risk by the record number of fires in the Amazon in 2019[5]. Many were thought to be linked to illegal activities[6]. Global companies and investors have also warned they might be forced to boycott Brazilian commodities due to the increased risks of land grabbing and deforestation[7,8].

Regulatory action as a result of illegal deforestation can directly impact on the operations of traders and investors. For example, in 2016, the Santander bank was fined R$ 47.5 million (US$ 15 million) for financing crops cultivated on illegally deforested areas[9], and in 2018 some of Brazil's largest soy traders were fined for purchasing soy linked to illegal deforestation[10].

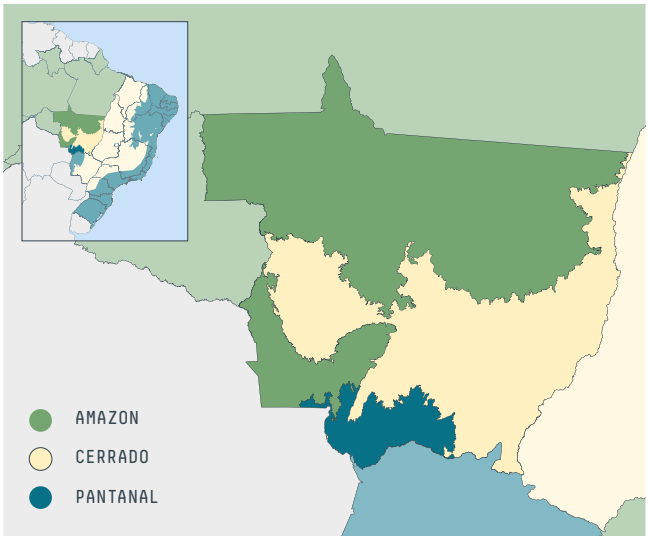
Many consumer markets have indicated that they want their consumption to be decoupled from deforestation (e.g. through the New York Declaration on Forests, and the Amsterdam Declarations Partnership), but these initiatives often overlook the more basic requirement of whether the goods they buy are produced in compliance with national regulations.

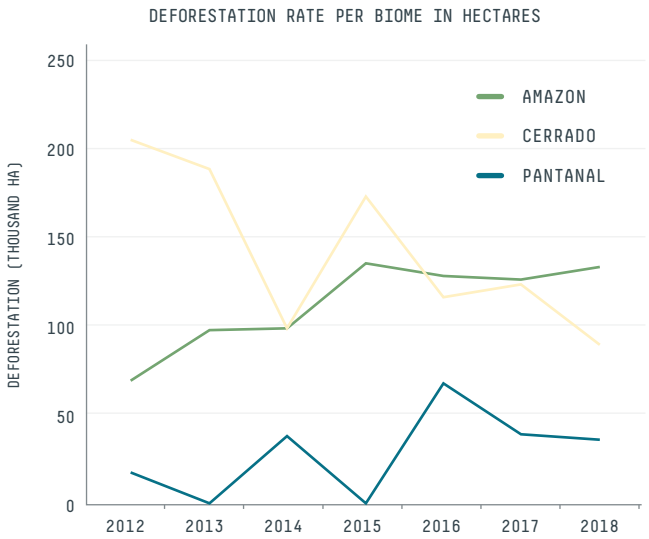
Even the Amazon Soy Moratorium, a multi-stakeholder voluntary agreement which is widely recognised as having significantly contributed to the reduction of soy-driven deforestation in the Amazon by monitoring where soy is grown[11], does not monitor deforestation and compliance at farm level. This means that even farms which grow soy in compliance with the Soy Moratorium may be linked to illegal deforestation elsewhere on the farm. Eradicating illegal deforestation is a critical step towards achieving deforestation-free supply chains.

In Mato Grosso, the state which produces the most soy in the Amazon and in Brazil as a whole, over 85% of the deforestation between August 2018 and July 2019 was illegal[12].

But, to date, it has been unclear to what extent soy, Brazil's most profitable export commodity, is linked to illegal deforestation. This briefing seeks to address this gap, providing an estimate of the amount of illegal deforestation taking place on soy farms, and examining how global markets are exposed to deforestation risks as a result. The analysis focuses on Mato Grosso, where 28% of Brazilian soy originates, using detailed deforestation licencing information published by the government.

BOX 1. MATO GROSSO – BRAZIL'S BIGGEST PRODUCER OF SOY





Mato Grosso is Brazil's third largest state by area. It is uniquely biodiverse as it is the only Brazilian state to encompass significant parts of three different biomes (ecoregions):

- **The Amazon:** the largest rainforest in the world – covers 57% of the state.
- **The Cerrado:** a highly biodiverse biome composed of grasslands, wooded savannah, and forests – covers 37% of the state.
- **The Pantanal:** the world's largest tropical wetland area – covers 6% of the state.

Mato Grosso is also key for Brazil's agribusiness economy. It produces 28% of Brazilian soy[13] and the same proportion of exports[14]. Soy crops cover nearly 10 million hectares of the state – an area bigger than Portugal – producing around 32 million tons of soy (2019 harvest)[15].

Over 75% of the soy produced in Mato Grosso is shipped to international markets. This trade is worth US$ 9 billion per year.

HARVESTING SOY IN MATO GROSSO | PHOTO: RODRIGO VARGAS, ICV

MATO GROSSO AND ILLEGAL DEFORESTATION

Annual deforestation rates in the Brazilian Amazon have ranged from 450,000 to 790,000 hectares (ha) over the last 10 years (2009 – 2019), peaking in 2019 at almost 1 million ha, an area six times the size of London. In the Cerrado, deforestation rates decreased slightly over this period, but still 650,000 ha were cleared in 2019[16].

Mato Grosso has some of the highest rates of deforestation in Brazil, accounting for 16% of deforestation in the Cerrado (the highest level of any state) and 31% of deforestation in the Amazon (the second highest level) over the last two decades.

Our analysis found that in total around 1.7 million ha of native vegetation were cleared in Mato Grosso between 2012 and 2017. This is equivalent to converting an area twice the size of London per year.

We found that 97% of the total deforestation in Mato Grosso in this period was illegal.

Figure 1. Deforestation in Mato Grosso between 2012 and 2017 by legal status.

The need to eradicate illegal deforestation and improve compliance with the Forest Code in Brazil is recognised across the entire soy supply chain. A number of traders have made zero-deforestation commitments (ADM, Amaggi, Bunge, Cargill, LDC, COFCO). And soy associations, including the Brazilian Association of Vegetable Oil Industries (ABIOVE)[17] and the Brazilian Association of Soybean Producers (APROSOJA)[18], the agribusiness sector in general, including the Agriculture Parliamentary Front (FPA)[19] and the Brazilian Agribusiness Association (ABAG)[20] have all recognised the importance of tackling illegal deforestation.

The Brazilian government has also recognised that addressing illegal deforestation is a priority, with statements from the current Ministry of Environment[21] and vice-president[22]. It is also a crucial part of Brazil's climate plan, with a target to eradicate illegal deforestation included in the Nationally Determined Contribution (NDC).

In Mato Grosso, the Produce, Conserve and Include Strategy (PCI), a multi-stakeholder initiative that brings together the government, private sector, and civil society to address sustainability, has established a specific target to eradicate illegal deforestation in the state by 2020[23]. Mato Grosso's government is also a partner of the Tropical Forest Alliance (TFA), which aims to halt deforestation associated with commodity supply chains.

BOX 2. METHODOLOGY

This study uses official spatial data on deforestation licenses issued by Mato Grosso's environmental agency (SEMA) to determine where deforestation took place without a licence and was therefore illegal.

By overlaying maps (2017) of soy plantations with land registries that provide rural property boundaries (CAR, SIGEF, others) we were able to identify the farms growing soy in 2017. We then quantified the amount of illegal deforestation that occurred on these farms between 2012 and 2017.

Our focus was not only on illegal deforestation in areas used for soy cultivation, but also on illegal deforestation at the farm level. This is fundamental as legal compliance is assessed at farm level.

To assess the exposure of global markets to soy grown on farms where illegal deforestation had taken place, we drew on export flows mapped by Trase.

Full details of the methodology are available here.

BURNING IS USED TO CLEAR THE LAND | PHOTO: RODRIGO VARGAS, ICV

SOY AND ILLEGAL DEFORESTATION

We identified 1.4 million ha of deforestation on **registered farms** in Mato Grosso between 2012 and 2017. Of this, 27% (or around 380,000 ha) was on farms that **were growing soy in 2017**. We found that 95% of deforestation on soy farms was illegal.

This illegal deforestation was identified on 2,252 soy farms, which represented just 10% of all the soy farms and accounted for around 20% of the soy area in Mato Grosso in 2017. Nearly 80% of the soy was on farms with no evidence of illegal deforestation.

Looking at the areas affected, we found that half of the illegal deforestation on soy farms took place on just 100 farms. And 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. These farms are mainly categorised as large, i.e. over 825 ha (73%), or medium sized (14%), according to definition established by the Brazilian government (Law 8.629/1993).

BOX 3. FARMS

- **Registered farms:** refers to farms that are registered in the Environmental Rural Registry (CAR) and in the Brazilian Land Management System (SIGEF), which provide details of farm boundaries. Of the 1.7 million ha of deforestation in Mato Grosso between 2012 and 2017, 1.4 million (85%) occurred within registered farms.
- **Soy farms:** Our analysis considers farms that were growing soy in 2017 and deforestation that took place on these properties between 2012 and 2017.

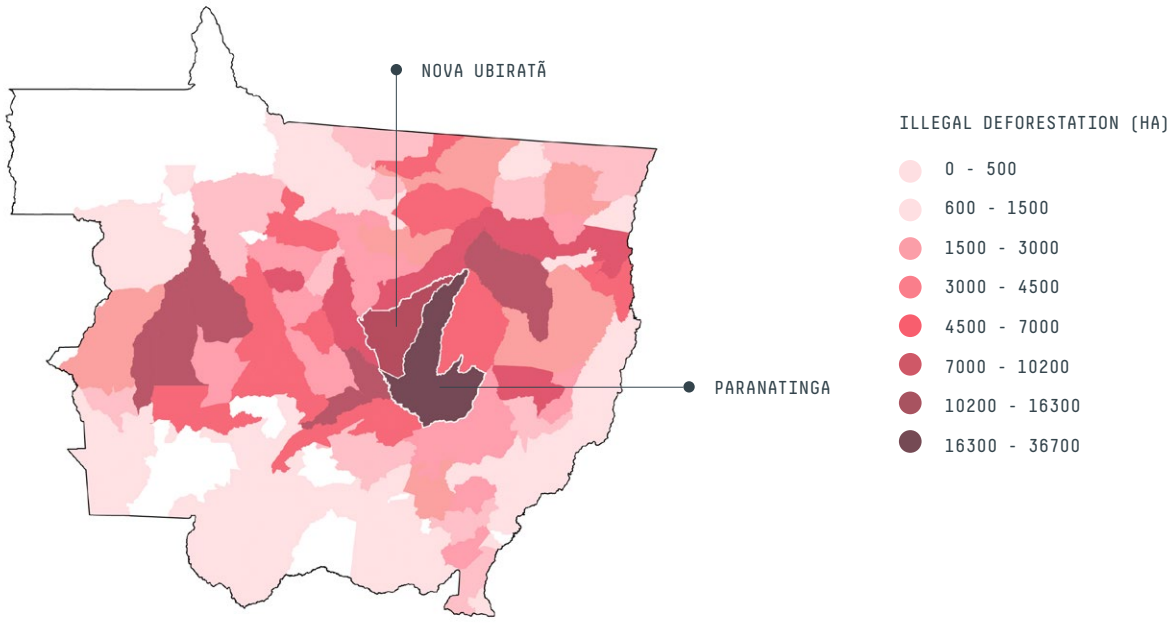


Figure 2. Illegal deforestation (ha) on soy farms per municipality in Mato Grosso. Over half of this is concentrated in just 15 municipalities, with Paranatinga and Nova Ubiratã accounting for 10% and 5% respectively.

These results show that while there are significant levels of illegal deforestation on soy farms in Mato Grosso, it is highly concentrated in a small proportion of the soy farms in the state. Soy from these farms contaminates the whole supply chain and could undermine the reputation of the whole soy sector in the state.

Around one quarter (82,000 ha) of the land that was cleared illegally on these farms between 2012 and 2017 had been converted to soy plantations. Most of the rest of the land cleared was likely to have been pasture in 2017, but could be used for soy cultivation in the future. Deforested lands are often initially used for pasture and later converted to soy[24]. Indeed, levels of conversion for soy were found to be higher for land that had been cleared for longer, with 37% used for soy in 2012 and 30% in 2013.

The illegal deforestation identified on soy farms was spread across the state, but more than half was concentrated in just 15 municipalities. The highest levels of illegal deforestation on farms were found in the neighbouring municipalities of Paranatinga (10%) and Nova Ubiratã (5%).

ILLEGAL DEFORESTATION AND THE SOY MORATORIUM

The Soy Moratorium, a multi-stakeholder initiative established in 2006, is designed to halt soy-driven deforestation in the Amazon, providing soy buyers with reassurance that the soy they are buying has not been produced on recently deforested areas.

Under the Soy Moratorium, members of the main soy trading associations in Brazil agree not to purchase or export soy grown on areas in the Amazon that were deforested after July 2008. Farms that cultivate soy on land that has been deforested since July 2008 are blacklisted by the Soy Moratorium monitoring mechanism. But the mechanism does not blacklist soy farms where deforestation has taken place in areas of the farm where soy is not cultivated. This means compliance at the farm level is not monitored.

We found that 24,000 ha of soy had been planted on land deforested between 2012 and 2017 in the Amazon biome in Mato Grosso. This is consistent with non-compliance reported by the Soy Moratorium monitoring mechanism. According to the most recent monitoring report publicly available[25], 68,000 ha of soy in Mato Grosso have been identified as non-compliant since 2008.

However, when we looked at all deforestation that occurred within the boundaries of soy farms in the Amazon biome in Mato Grosso, we found an extra 115,000 ha of deforestation. Almost all of this (106,000 ha or 92%) was illegal.

These areas had not been converted for soy by 2017, and would not be detected by the Soy Moratorium monitoring mechanism because it only monitors the area of land where soy is grown and not the entire farm. Yet these farms were still in breach of the Forest Code due to illegal deforestation. As a result, the soy produced on these farms may have been exported as deforestation-free under the Soy Moratorium, putting global markets at risk of importing soy from farms linked to illegal deforestation in the Amazon.

These results reinforce other studies that have suggested that soy producers are more likely to comply with the Soy Moratorium than with legislation such as the Forest Code[26,27]. This makes it clear that there is a need to expand the scope of the Soy Moratorium monitoring mechanism to recognise deforestation at the farm level and that more work is needed to ensure compliance in the soy sector.

It is important to highlight that we were unable to analyse whether or not the soy farms where illegal deforestation took place had been blacklisted by the Soy Moratorium monitoring checks as details of blacklisted farms are not publicly available. The transparency of this information is crucial to allow different players across the supply chain, such as retailers, to assess and manage the risk of being exposed to deforestation by their suppliers as well as to enable civil society to identify soy farmers linked to deforestation.

CERRADO WORSE THAN THE AMAZON

Despite these gaps, the Soy Moratorium has significantly contributed to a reduction in direct soy-related deforestation in the Amazon[28]. But this protection does not apply to the Cerrado biome, which as a result is more vulnerable.

Around 880,000 ha of native vegetation were cleared in the Cerrado within Mato Grosso between 2012 and 2017. Almost all of this (98.5%) was illegal.

Around 235,000 ha of the illegal deforestation in the Cerrado took place on soy farms. This is almost twice the area found on soy farms in the Amazon.

Our data shows that 62,000 ha of this illegally-cleared land on soy farms were converted for soy cultivation. This is more than three times the area converted to soy in the Amazon in the same period, which suggests that the Soy Moratorium is helping to reduce direct deforestation specifically for soy cultivation in the Amazon biome.

These results show the urgent need for measures to tackle illegal deforestation in the Cerrado and the need to introduce effective policies and mechanisms to disassociate soy production and investments from recently converted areas, as urged by the Cerrado Manifesto[29] and its signatories.

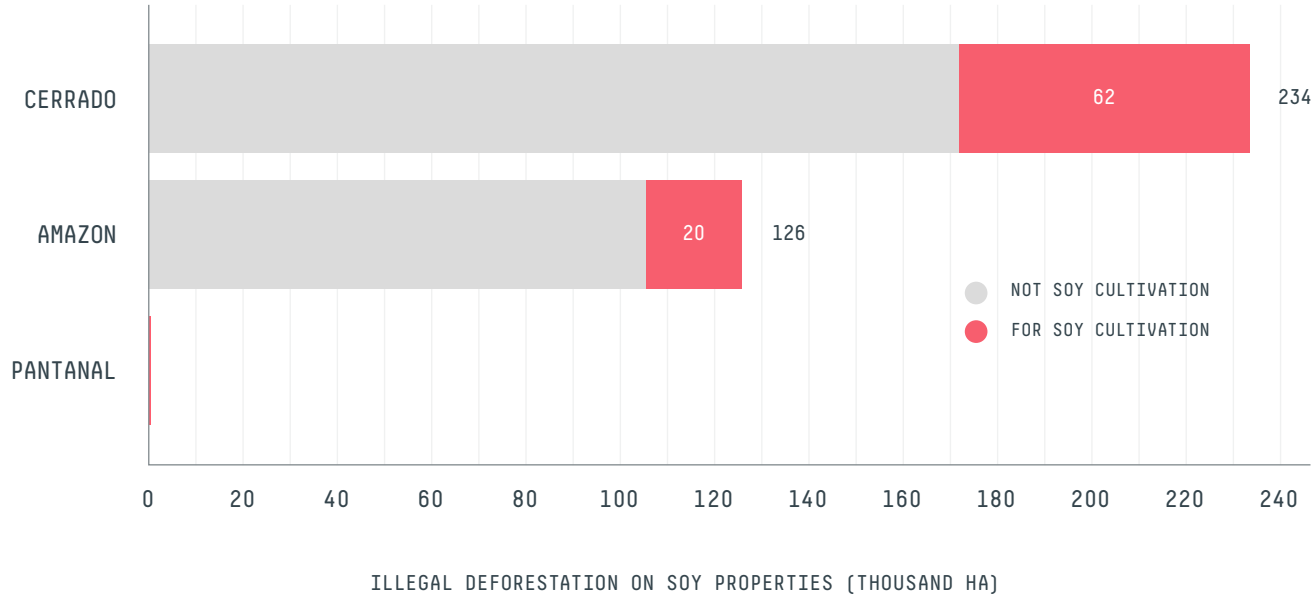


Figure 3. Illegal deforestation on soy properties in the Cerrado, Amazon, and Pantanal biomes between 2012 and 2017. Red shows the area of illegal deforestation on soy farms directly converted for soy, and grey shows the area of illegal deforestation on soy farms that had not been converted for soy by 2017.

MARKETS EXPOSURE TO ILLEGAL DEFORESTATION

It is estimated that 81% of the soy grown on farms where illegal deforestation took place in Mato Grosso was exported in 2018[30], with 46% of this shipped to China – Brazil's biggest export market. The European Union (EU) is the second most exposed export market for soy from farms with illegal deforestation. It is estimated that around 14% of that soy was shipped to the EU.

Around 19% of the soy produced on farms where illegal deforestation occurred remained in the domestic market. Some of this was likely to be processed domestically and used as animal feed for livestock that was then exported embedded in meat products.

These results suggest that soy buyers in different parts of the world do not appear to monitor legal compliance within their soy supply chain, echoing the findings from our previous briefing[31].

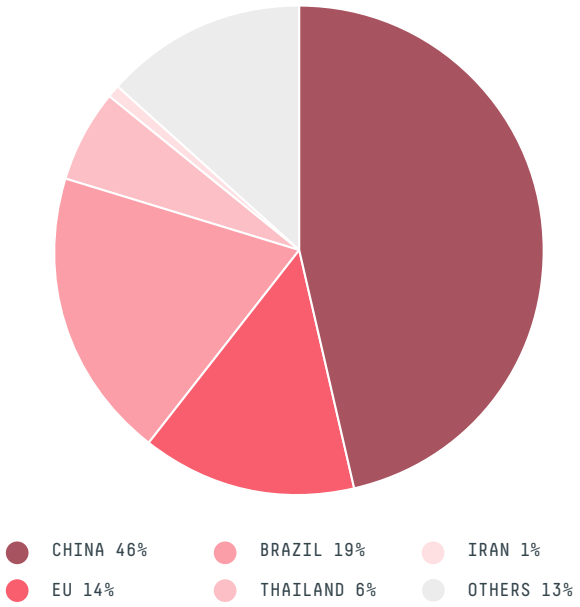


Figure 4. Main destinations for the soy grown on farms where illegal deforestation took place.

A VIEW OF THE AMAZON FOREST | PHOTO: RODRIGO VARGAS, ICV

CHINA

China is the biggest export market for Brazilian soy, and the largest buyer of soy produced in Mato Grosso, importing approximately 11 million tonnes from the state in 2018. Nearly one quarter of all of China's soy imports from Brazil came from Mato Grosso that year.

Our calculations show that 21% of China's soy imports from Mato Grosso in 2018 were likely to have come from farms where illegal deforestation had taken place. This represents approximately US$ 920 million worth of trade.

More than three quarters (76%) of the soy that is estimated to have been imported into China from the farms with illegal deforestation is likely to have come from just 15 municipalities. This information could help Chinese buyers to identify where the biggest risks of illegal deforestation associated with their soy imports lie.

Some of these municipalities were also the scene of forest fires that attracted the world's attention in 2019. Paranatinga, Canarana, São Félix do Araguaia, and Ribeirão Cascalheira are ranked in the 10 municipalities with the highest number of fires in Mato Grosso in 2019[32], showing that the deforestation risk remains in these places.

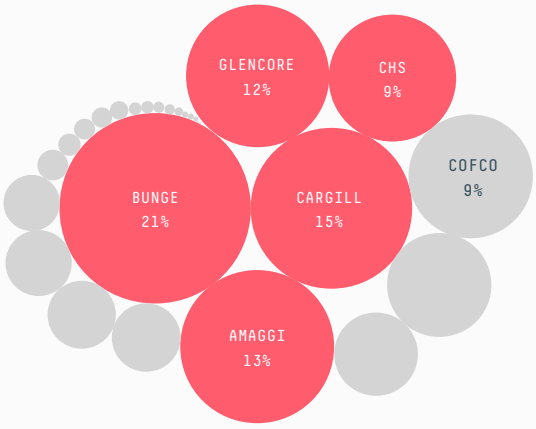
Using Trase data, we identified the traders likely to be exporting soy to China from the 15 municipalities with the the most soy produced on farms with illegal deforestation. These companies are the most exposed to trade in soy from farms linked to illegal deforestation in Mato Grosso. We estimate that the five companies (in red on chart) accounted for 70% of all the soy exported to China from these municipalities in 2018.

China's exposure to soy linked with illegal deforestation

21% of China's soy imports from Mato Grosso in 2018 were likely to be linked to illegal deforestation.

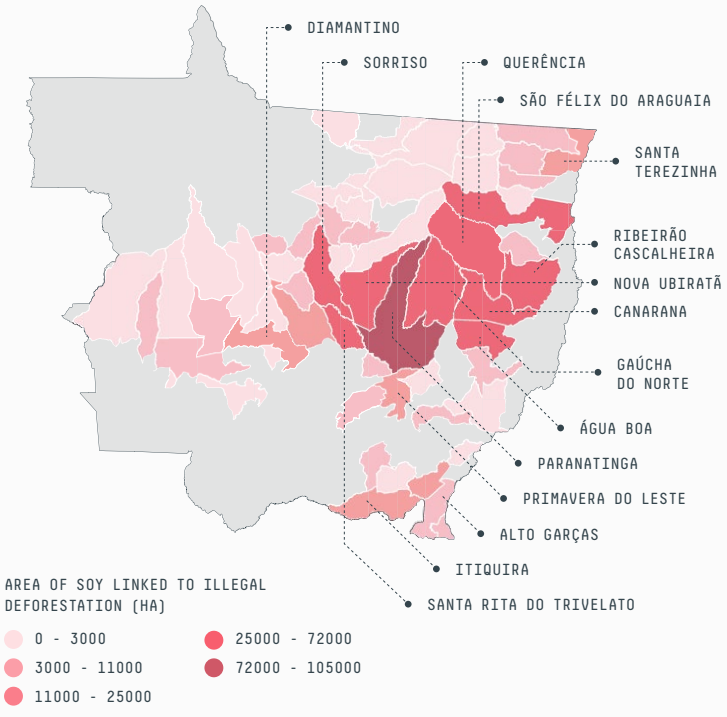
Traders most exposed:

Estimates using Trase data indicate that the five biggest exporters accounted for 70% of all the soy exports to China in 2018 from the 15 municipalities highlighted in the map.



Hotspots:

15 municipalities that export to China which have the most soy produced on farms with illegal deforestation.



EUROPEAN UNION

The European Union (EU) was the second largest importer of soy from the state of Mato Grosso, importing approximately 3.9 million tonnes in 2018. Around one third of the EU's soy imports from Brazil come from Mato Grosso, making it the largest source of EU soy imports within Brazil.

We estimate that approximately 19% of the EU's soy imports from Mato Grosso in 2018 were likely to have come from farms where illegal deforestation took place. This represents trade worth approximately US$ 295 million.

Seventy percent of the soy that is estimated to be exported to the EU and linked to illegal deforestation is likely to have come from just 15 municipalities, with one single municipality (Paranatinga) accounting for over 10%. Paranatinga and Nova Ubiratã were two of the 10 municipalities with the highest number of fires in Mato Grosso in 2019[33].

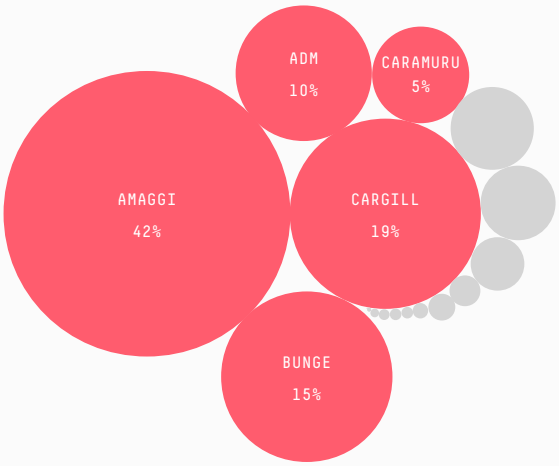
Using Trase data, we identified the traders likely to be exporting soy from these 15 municipalities to the EU. We estimate that the five traders exporting the most soy (in red) accounted for over 90% of this trade. These companies are the most exposed to trade in soy from farms linked to illegal deforestation in Mato Grosso.

EU's exposure to soy linked with illegal deforestation

Almost 20% of the EU's soy imports from Mato Grosso in 2018 were likely to be linked to illegal deforestation.

Traders most exposed:

Estimates using Trase data indicate that the five biggest exporters accounted for over 90% of all the soy exports to EU in 2018 from the 15 municipalities highlighted in the map.



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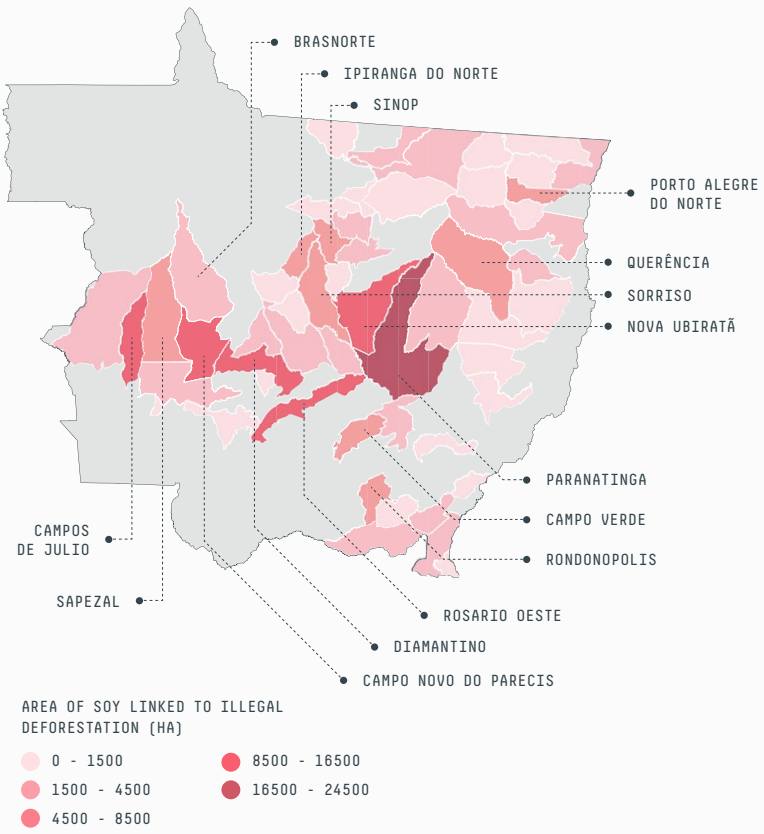

CONCLUSION

The Brazilian Forest Code states that deforestation is only permitted where authorisation has been given through a deforestation licence. This process is critical as it ensures legal compliance, regulates land use, and safeguards threatened species.

Yet 97% of the total deforestation between 2012 and 2017 in Brazil's largest soy-exporting state took place without a licence and was therefore illegal.

Our results show that trading companies and global markets are exposed to illegal deforestation via their soy supply chains. Soy from different farms is usually mixed for storage, processing and transportation so even small volumes of soy associated with illegal deforestation risk contaminating the whole supply chain. This makes it difficult to differentiate sustainably-produced soy from soy linked to illegal deforestation.

We found that the illegal deforestation associated with soy production is highly concentrated in a small number of soy farms, mostly on medium-sized and large farms. This knowledge presents governments and buyers with a ready opportunity to address the problem. Farms linked to illegal deforestation may damage the reputation of all Brazilian soy exports, threatening the success of international trade deals, such as the EU-Mercosur trade deal.

It is critical that governments, traders, buyers and investors work together to address this issue, taking action to end illegal deforestation as a critical first step towards achieving zero-deforestation supply chains. Steps could include:

KEY PLAYERS	ISSUE	ACTIONS NEEDED
TRADERS	Our findings suggest that soy traders are exposed to the risk that their suppliers are linked to illegal deforestation.	(i) Put mechanisms in place to systematically monitor whether or not suppliers comply with national laws and regulations, including registration in the Rural Environmental Registry (CAR) and request deforestation licences when deforestation is detected on their suppliers' farms. (ii) Blacklist non-compliant suppliers and support the implementation of programmes to bring the farms into compliance with the law and then allow them to resume trading.
CONSUMER GOODS MANUFACTURERS AND RETAILERS	Products which use soy (including soy derivatives or embedded soy in animal products) may originate from land deforested illegally. This exposes consumer goods manufacturers and retailers to the risk that they are selling products which are linked to illegal deforestation, creating a risk of reputational damage.	(i) Require suppliers to demonstrate compliance with national regulations. (ii) Join pre-competitive and collaborative efforts to support suppliers to transition towards zero-deforestation supply chains.

KEY PLAYERS	ISSUE	ACTIONS NEEDED
FINANCIAL INSTITUTIONS	Financial institutions may be unaware that their investments are financing companies and farmers exposed to illegal deforestation in their supply chains.	(i) Ensure due diligence processes address the risks that clients may be connected to illegal deforestation. (ii) request that companies and banks have mechanisms in place to demonstrate they are only purchasing/producing/financing soy grown on farms in full compliance with national laws.
EUROPEAN AND CHINESE GOVERNMENTS	We estimate that 21% of China's and 19% of the EU's soy imports from Brazil in 2018 were likely to have come from farms where illegal deforestation took place. This creates a risk for the whole supply chain as soy from different farms is usually mixed for storage, processing and transportation.	Governments can demonstrate leadership by introducing regulations to mitigate the risk of their imports being linked to illegal deforestation, building on the example of EU Timber Regulation and China's new Forest Law[34].
BRAZILIAN FEDERAL AND SUB-NATIONAL GOVERNMENTS	(i) While rates of deforestation in the Brazilian Amazon have been increasing, the measures adopted by the current government have weakened the environmental agencies responsible for controlling deforestation. This alongside the high rates of illegality puts the Brazilian agribusiness at risk of losing access to markets. (ii) Deforestation licences are not publicly available for all the states in the country. This makes it difficult to assess the legality of deforestation in other regions than Mato Grosso, undermining opportunities to tackle illegal deforestation.	(i) Strengthen and enforce the implementation of the Forest Code and its mechanisms, at federal and state levels. (ii) Strengthen policies and measures to eradicate illegal deforestation, land grabbing and land conflicts. (iii) Ensure public availability of deforestation licence as determined by the Brazil's Freedom of Information Law (FOI) (Law 12.527/2011).

KEY PLAYERS	ISSUE	ACTIONS NEEDED
SOY MORATORIUM	(i) The Soy Moratorium currently only monitors the area of the farm where soy is grown, creating a risk that deforestation elsewhere on the farm – and therefore illegality – is being missed. (ii) Lack of transparency of blacklisted farms prevents retailers and others from managing the risk of being exposed to deforestation. (iii) The Soy Moratorium only applies to the Amazon, leaving other highly biodiverse biomes such as the Cerrado at risk.	(i) Expand criteria to request compliance with the Forest Code, and monitor deforestation at the farm level. (ii) Improve transparency of the monitoring results, especially by making the Soy Moratorium blacklist and the deforested areas identified by the monitoring publicly available. (iii) Assess and systematically report the volume of soy being consumed and exported by companies that are signatories to the Soy Moratorium. (iv) Extend the agreement to address deforestation and conversion in the Cerrado biome.

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