



Chain Reaction Research is a coalition of Aidenvironment, Profundo and Climate Advisers.

Contact:

www.chainreactionresearch.com;
info@chainreactionresearch.com

Authors:

Sarah Drost, Aidenvironment
Barbara Kuepper, Profundo
Matt Piotrowski, Climate Advisers

With contributions from:
Bart Slob, Independent Consultant
Marco T. Garcia, Aidenvironment
Tim Steinweg, Aidenvironment



Brazilian State of Tocantins: A Hotspot for Cerrado Deforestation

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The Brazilian state of Tocantins is the latest hotspot for soy- and cattle-related deforestation. In 2018, more land was cleared here than in any other state of the Brazilian Cerrado, a large tropical savanna biome that covers more than 20 percent of Brazil. Overall Cerrado deforestation rates have declined in recent years, but Tocantins continues to see high rates of forest loss. Soy sourced from Tocantins carries a high risk of being connected with legal and illegal land clearing. A close monitoring of the implementation of zero-deforestation commitments may mitigate risks for traders, investors and end-users of agricultural commodities from Tocantins.

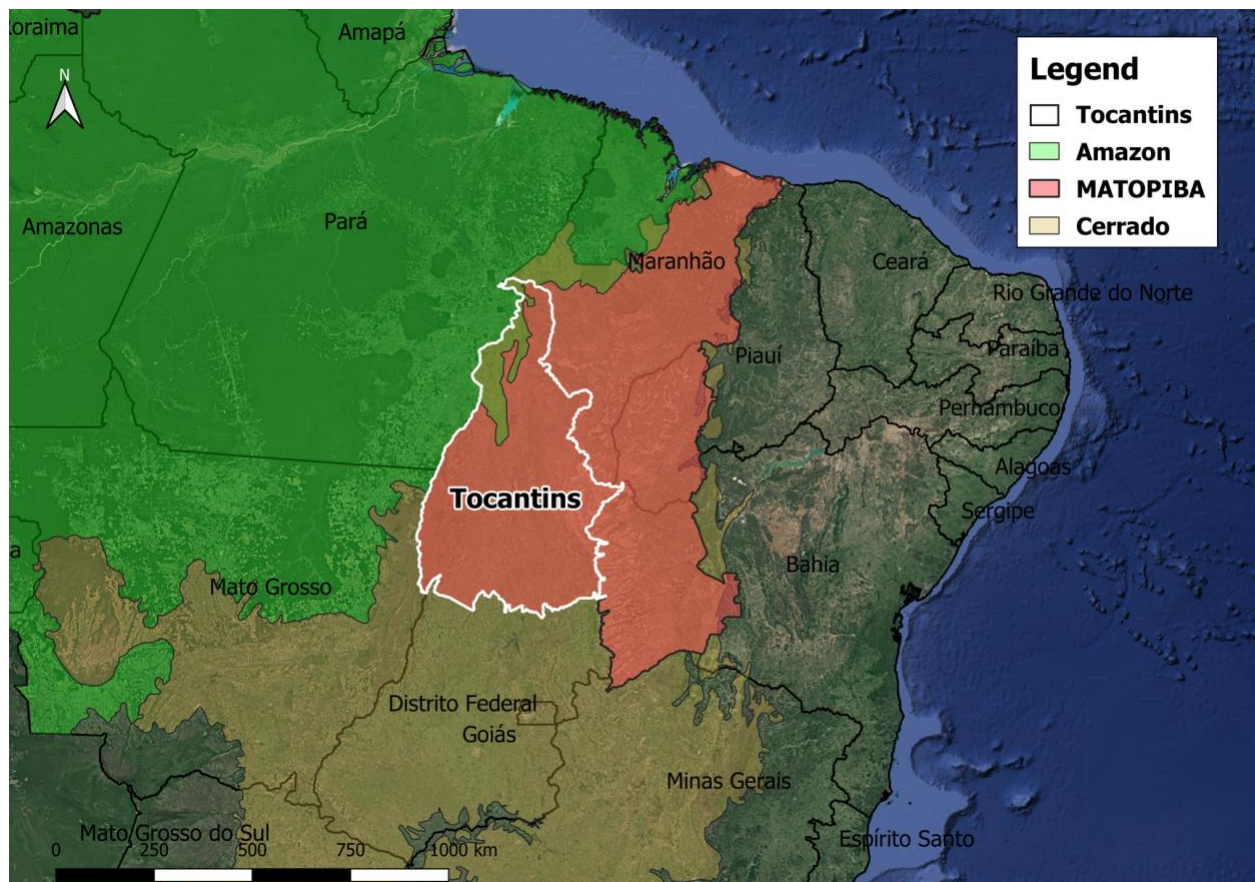
Key Findings:

- **In 2018, more forest was cleared in Tocantins than in any other Cerrado state.** Tocantins is a sparsely populated rural state in central Brazil. Tocantins deforestation of 153,320 ha contributed to 23 percent of total forest loss in the Cerrado in 2018.
- **The soy and beef markets drive deforestation in Tocantins.** Soy plays a key role in Tocantins' economy, due to a favorable climatic and political environment. Between 2008-2017, 947,287 ha of natural forest formations were transformed for soy cultivation and livestock pasture.
- **The key supply chain actors in Tocantins are cattle ranchers and soy traders.** The largest private landowners in Tocantins are active in the soy and livestock sectors, and they are often involved in local and national politics. All major soy traders operate in Tocantins.
- **Soy sourced from Tocantins carries a high risk of being linked to legal and illegal deforestation.** Case studies reveal that soy production in the municipalities Lagoa de Confusão and Campos Lindos could be linked to illegal deforestation, environmental fines, embargoed areas, land disputes, and slave labor. Glencore and Cargill are the main soy traders in these municipalities. Cattle from deforested farms may be linked to JBS' and Masterboi's slaughterhouses.
- **Key soy traders, including ADM, Bunge, Cargill, Louis Dreyfus, and Cofco, and major beef retailers, such as Carrefour, Cencosud and Casino/Grupo Pão de Açúcar, may therefore face elevated deforestation risks in their supply chains.** Strengthening zero-deforestation commitments and their strict implementation could mitigate such risks. This may include disclosure of supply chain data, indirect supply chain tracking, stricter enforcement of non-compliance mechanisms, and continuous monitoring of land use change, both legal and illegal.

Tocantins is a sparsely populated rural state in central Brazil

Tocantins, located in central Brazil, is the country's youngest state. Initially part of the state of Goiás, it became a separate administrative entity in 1989. The entire state is part of the region known as Matopiba (consisting of the states of Maranhão, Tocantins, Piauí and Bahia) (Figure 1). With a [population](#) of 1.56 million (the 24th most populated of Brazil's 27 states), Tocantins is mostly rural and sparsely populated. Agriculture and livestock account for [53 percent](#) of the state's land use (14.8 million ha out of the total 27.8 million ha). Eighty-eight percent of Tocantins falls within the Cerrado biome, a large tropical savanna biome that covers more than 20 percent of Brazil. The remaining 12 percent of the state falls within the Amazon biome (Figure 2).

Figure 1: Tocantins in Matopiba (Brazil)



Source: [CRR](#)

Figure 2: General facts about Tocantins

Population (2018)	1.56 million (0.7% of total)
Main economic activities (2016)	Services (66.8%) Industry (12.0%) Agriculture (11.5%)
Main exports (2018)	Soybean (83%) Beef (9.7%)
Land use (2017)	Natural forest formations (14.2 million ha) Non-Forest natural formations (5.6 million ha) Pasture (5.8 million ha) Agriculture (0.8 million ha) Agriculture or pasture (1.0 million ha)
Biomes	Cerrado (88%) Amazon (12%)

Source: [IBGE](#), [Mapbiomas](#)

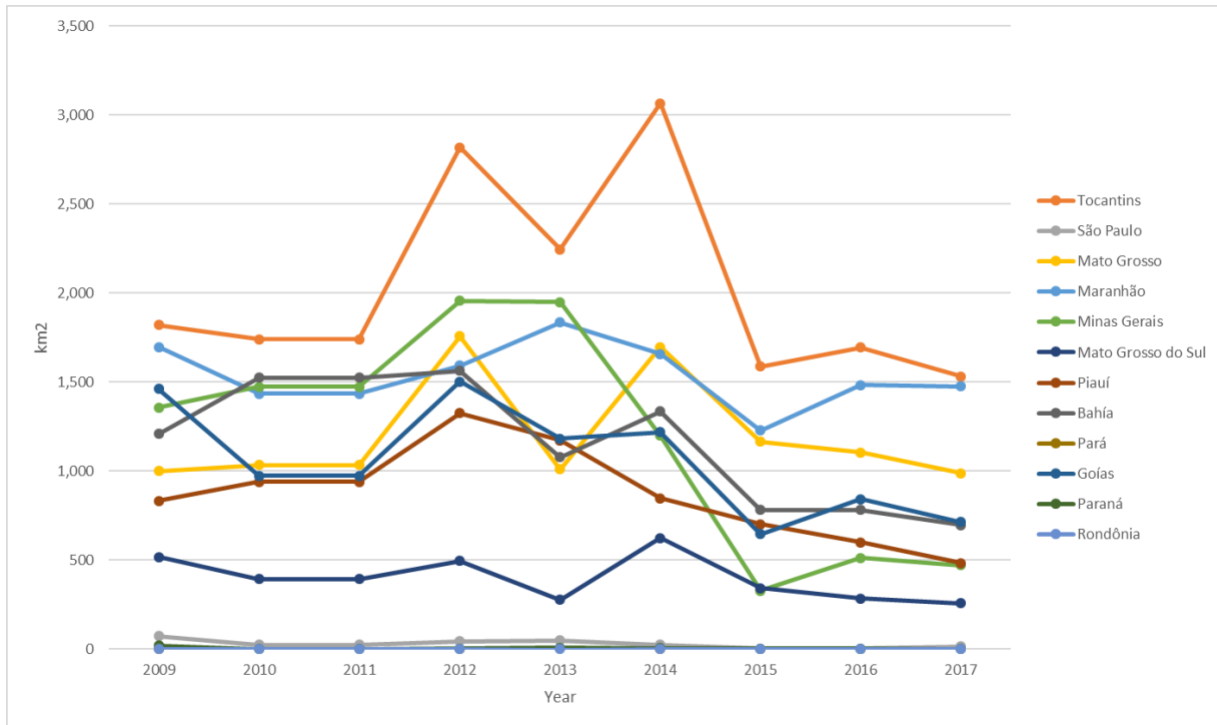
Tocantins’ state government favors large-scale soy and livestock production. The soy industry enjoys several tax benefits related to agricultural inputs and [soybean derivatives](#). Moreover, the [fertilizer industry](#) enjoys an 85 percent reduction on sales tax and does not pay import taxes on raw materials and inputs. Also, the state has implemented several large-scale [agricultural development plans](#) in the last two decades.

On a local and national level, farmers-turned-politicians have favored the interests of the farming sector over forest conservation. One of the most prominent among them is Senator Kátia Abreu, who originates from Tocantins and was Brazil’s Minister of Agriculture in 2015 and 2016. She is allegedly in favor of [Chinese investment](#) in the beef sector. The current governor of Tocantins, Mauro Carlesse, lobbies for maintaining the [exemption](#) from the Tax on the Circulation of Goods and Services (ICMS) of grains produced in Tocantins for export.

Tocantins is a hotspot for Cerrado deforestation

In 2018, more forest was cleared in Tocantins than in any other Cerrado state. Some [153,320 ha](#) were deforested, which was 23 percent of the total forest loss in Cerrado states (Figure 3). At 2,500 ha in 2018, forest loss in the Amazon area of Tocantins was relatively low. This amount was 19 percent less than the previous year and accounted for 0.3 percent of [total Amazon deforestation](#).

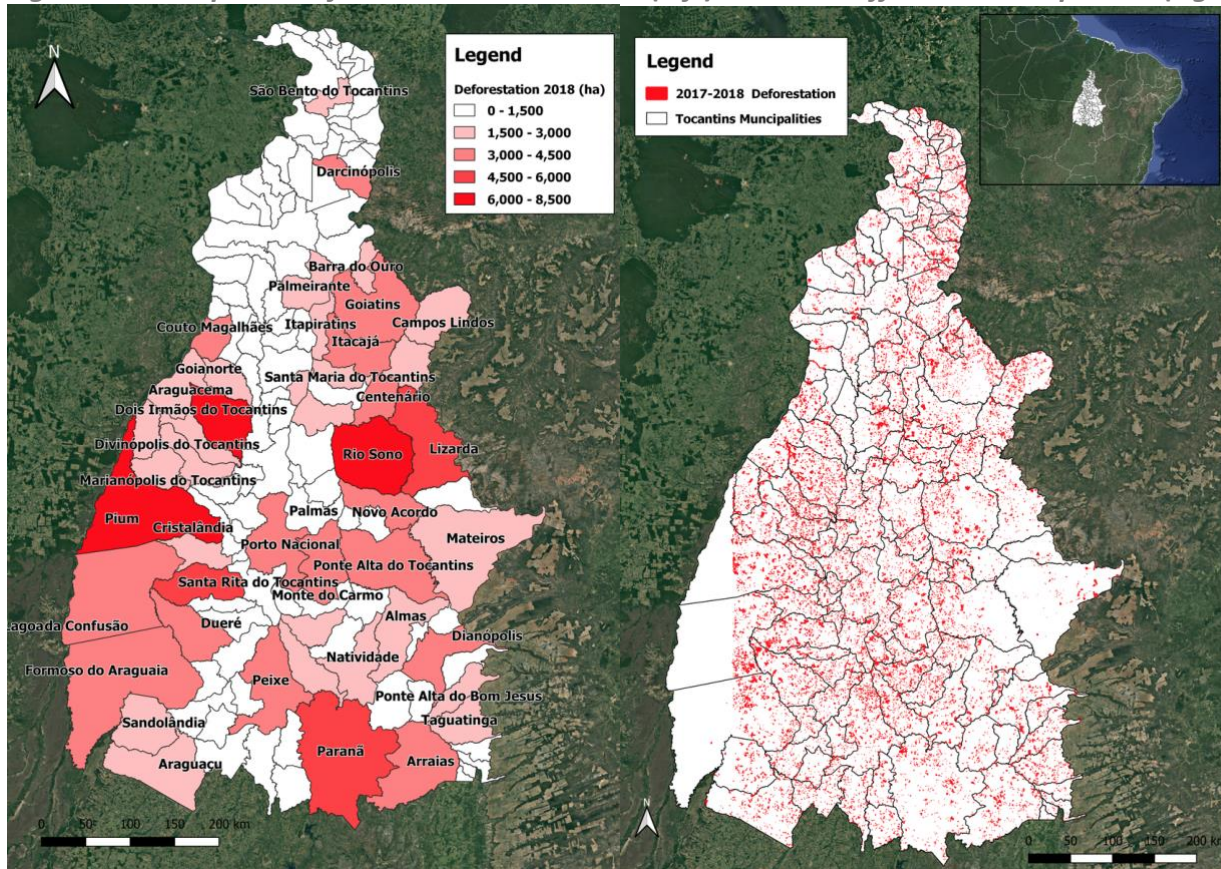
Figure 3: Deforestation per state in the Cerrado biome, 2009-2018



Source: [Terras Brasilis](#)

Deforestation is widespread throughout Tocantins. The municipalities Pium, Dois Irmãos do Tocantins, Rio Sono, Paranã, Santa Rita do Tocantins, Lizarda, Goiatins, Lagoa da Confusão, Formoso do Araguaia, and Dueré had the highest deforestation rates in 2018 (Figure 4). Over 55,000 ha of native vegetation (36 percent of the total deforestation in the state) were cleared in these municipalities in 2018 ([Prodes](#) and [GLAD](#)).

Figure 4: Widespread deforestation in Tocantins (left) and most affected municipalities (right)



Source: [Prodes](#) and [GLAD alerts](#)

Soy and Beef Drive Deforestation in Tocantins

Between 2008 and 2017, a total of [947,287 ha](#) of natural forest formations were transformed for agricultural use and livestock (Figure 5). As in other regions in Brazil, the main drivers of this deforestation are soy, cattle and [land speculation](#). Whereas most forest is converted into livestock pasture, a significant area of pasture is subsequently transformed into soy farms. This activity is illustrated by the fact that between 2008 and 2017, [248,969 ha](#) of pasture were converted into agricultural land. This represents 34 percent of all current agricultural land. As such, forest conversion into pasture, as presented in Figure 5, may still be linked to soy production that takes place several years later.

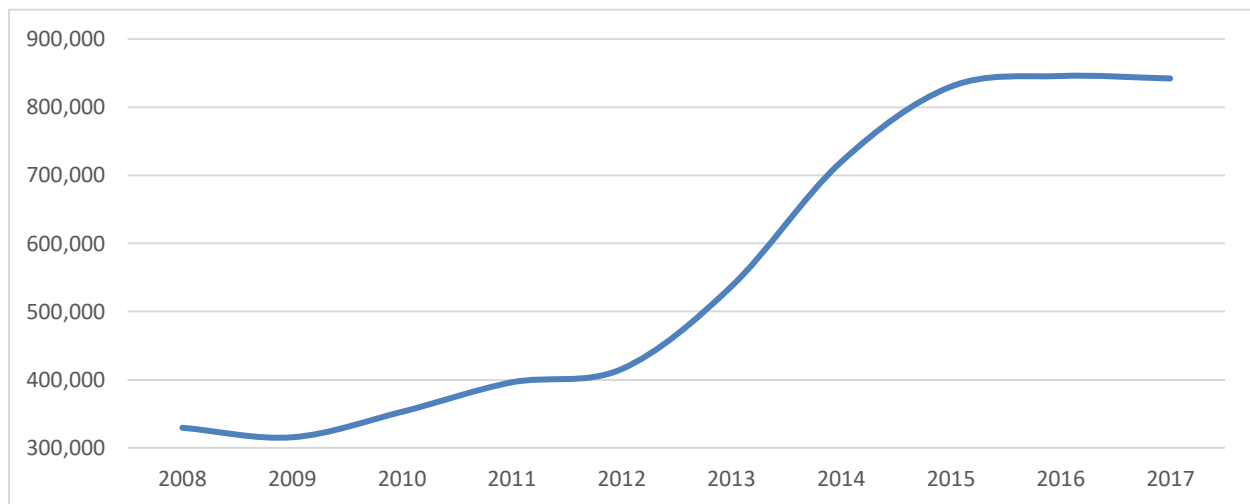
Figure 5: Forest conversion in Tocantins 2008-2017

Forest conversion into	Area (ha)
Pasture	704,637
Agriculture	103,572
Agriculture or pasture	139,077
Total	947,287

Source: [Mapbiomas](#)

Soy plays a key role in Tocantins' economy and is by far the most important crop. Since 2008, the area planted with soybeans in Tocantins has almost tripled (Figure 6), although expansion has been limited between 2015-2017. In 2017, soybeans covered [842,160 ha](#) in the state, representing 71 percent of all land used for agricultural crops. Tocantins produced over [3 million metric tons](#) of soybeans in the harvest year of 2017/2018. In 2018, soybeans accounted for an estimated [83 percent](#) of the state's total exports, followed by beef (9.7 percent). The second most [important crop](#) was corn, which is often used in rotation with soy.

Figure 6: Soy planted area in Tocantins, 2008-2017 (ha)



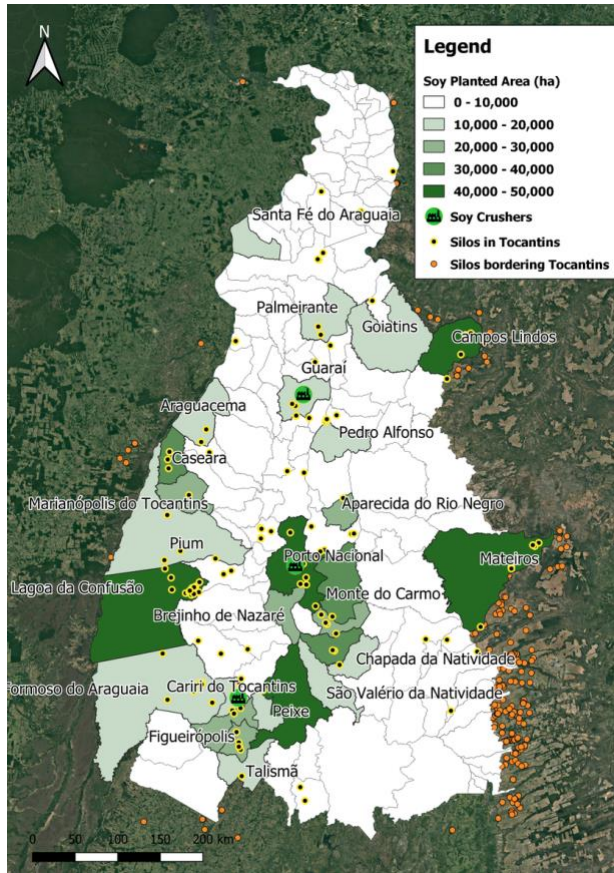
Source: [IBGE 2007](#)

Tocantins has favorable agricultural and climate conditions for soy cultivation. Well-distributed rainfall patterns, fertile soils, absence of slope and altitude restrictions, and the existence of large [tropical floodplains](#) allow for multiple harvests each year. The Agricultural Defense Agency of Tocantins ([ADAPEC](#)) told CRR in December 2018 that the favorable conditions for soy cultivation explain its expansion.

Cultivation of soybeans is spread across Tocantins, with three main areas of concentration (Figure 7). Most of the direct forest-to-agriculture [conversion](#) is taking place in:

- The municipalities of Campos Lindos ([5.3 percent of Tocantins' soy production](#)) and Mateiros (5.0 percent) in the east, bordering soy areas in Maranhão and Bahia;
- The western municipality of Lagoa da Confusão (5.0 percent), bordering Mato Grosso;
- Along the North-South rail- and highway (to Itaqui port in Maranhão), including the municipalities of Peixe (6.2 percent) and Porto Nacional (4.9 percent).

Figure 7: Soy planted area in Tocantins, warehouses, and soy crushers



Source: [IBGE 2017](#), [SICARM](#), [ABIOVE](#)

Cattle ranchers and soy traders are key supply chain actors

The ten largest private landowners in Tocantins own a total of 2.7 percent of all registered property (Figure 8). However, most of Tocantins is public land, and [Incrá Superintendencia Estadual Do Tocantins](#), the Brazilian public agency responsible for allocating rural settlements, is its largest landholder (168,805 ha). In Brazil, public land is particularly vulnerable to practices of [land grabbing](#) and deforestation.

Seven of the ten largest private landowners recently deforested land

Seven of the ten largest known private landowners have cleared 2,396 ha of native vegetation in Tocantins in the last two years. The [Brazilian Ministry of Environment](#) classifies more than half of the vegetation as forest. The other 1,121 ha of Savanna Grassland and Savanna Park can be considered

grassland formations. The major economic activities of these private landowners include cattle, soy, and logging (Figure 8).

Figure 8: Deforestation by top 10 private producers in Tocantins in 2017-2018

Largest private landowners	Landholding (ha)	Principle commodities	Deforestation in 2017-2018 (ha)
Marcelo Henrique Limírio Gonçalves	71,791	Cattle, Soy	553
Naçoitan Araújo Leite	32,075	Cattle, Soy	No
Eco Brasil Florestas AS	31,260	Wood and pulp	No
Javaes S/A Agropecuária	30,799	Cattle	457
Tertulino Guimarães	21,988	Unknown	132
Fazenda Vista Alegre AS	20,688	Cattle	69
Agropecuária Santa Mariana Do Tocantins Ltda	20,659	Cattle	No
Agropecuária Morro Branco Ltda	20,593	Cattle	1,072
Companhia Brasileira de Agropecuária	20,029	Rice, cattle, eucalyptus	35
Agropecuária Paranatins Ltda	18,995	Soy	78
Subtotal	288,877		2,396
Total registered property	10,895,632		

Source: [Incrá](#), GTA data

The largest private landowners in Tocantins are active in the agriculture and livestock sectors, and they are often involved in local and national politics. Marcelo Henrique Limírio Gonçalves, the single largest private landowner, appears in the *Forbes* List of [Brazilian Billionaires](#). He and his family, who acquired most of their fortune in the pharmaceutical sector, [allegedly](#) have relationships with high-ranking politicians. Gonçalves owns [20 companies](#), of which twelve are in Goiás, five in São Paulo, two in Tocantins, and one in Mato Grosso. In Tocantins, he and his son own Agropecuária Limírio Gonçalves Ltda in Lagoa do Tocantins, with the farms [Fazenda Serra Azul](#) and [Fazenda Serra Dourada](#). Soybeans and other grains are cultivated on both properties. Moreover, he owns a large cattle farm (Fazenda Rio Verde) in Araguaçu.

Naçoitan Araújo Leite, a local political leader ([mayor](#)) in Goiás, is associated with [abusing political power](#) and [improper campaigning](#). His name appears on the list of [embargoed properties](#) of Brazil's Environmental Protection Agency IBAMA, for deforestation in a conservation area (Serra Geral do Tocantins Ecological Station) in Tocantins' municipality Almas. He owns two companies: [Comercial Leite de Produtos Veterinários Ltda](#) (veterinary pharmaceuticals) and [Etiel Planejamento e Consultoria Agropecuários EIRELI](#) (consultancy services for agricultural and livestock activities). Considering the companies' activities, he is likely engaged in both cattle and agricultural production.

At least four of the major private property owners are involved in cattle breeding. These owners include Javaes S/A Agropecuária (in municipality Pium), Fazenda Vista Alegre SA (Araguanã), Agropecuária Santa Mariana Do Tocantins Ltda (Araguaçu), and Agropecuária Morro Branco Ltda (Novo Jardim).

The other private property owners on the list are engaged in various agricultural activities, including logging, soy, rice and eucalyptus. [Eco Brasil Florestas SA](#) is a logging company in Araguaína for wood and pulp, and [Agropecuaria Paranatins Ltda's](#) main economic activity is soy cultivation. Companhia Brasileira de Agropecuaria ([Cobrape](#)) is involved in rice cultivation, cattle, and eucalyptus plantations among others.

All major soy traders operate in areas with high-deforestation risks in Tocantins

ADM, Amaggi, Bunge, Cargill, Cofco, Louis Dreyfus, and Glencore are among the soy trading companies active in Tocantins (Figure 9). Agrex do Brasil S/A, a Brazilian agribusiness company and subsidiary of Mitsubishi Corporation, was the largest soy trader in 2017. Its market share makes up [18 percent](#) of the total 1.6 million metric tons of soy traded in the state (without domestic consumption). Cargill (17 percent) and Bunge (13 percent) rank second and third respectively. Bunge has the largest [warehouse capacity](#) in Tocantins, with 106,166 metric tons of storage capacity divided over five facilities (Campos Lindos, Cariri do Tocantins, Guaraí, Pedro Afonso, and Porto Nacional).

Figure 9: Top 10 soy traders in Tocantins

Traders	Parent company	Trade volume (MT)	Warehouse capacity (MT)	Crushing capacity (MT/day)	Zero-deforestation commitment (Y/N)
Agrex do Brasil	Mitsubishi Corporation (JP)	292,684	40,240		N
Cargill Agrícola	Cargill Inc. (USA)	279,458	29,420		Y
Bunge Brasil	Bunge Ltd (USA)	221,742	106,166		Y
Amaggi & LD Commodities	Amaggi Group (BR) & Louis Dreyfus Holding B.V. (NL)	154,878	45,610		Y
ADM do Brasil Ltda.	Archer Daniels Midland Company (USA)	123,323	-		Y
Granol	Granol Indústria, Comércio e Exportação S/A (BR)	117,145	76,030	2,900	N
Cofco International Brasil S/A	Cofco Corporation (CN)	96,536	-		N
Gavilon Agriculture Holdings	Marubeni Corporation (JP)	93,146	-		N
Glencore Brasil	Glencore Plc (CH)	90,431	-		N

Traders	Parent company	Trade volume (MT)	Warehouse capacity (MT)	Crushing capacity (MT/day)	Zero-deforestation commitment (Y/N)
Fiagril Participações S/A	Shanghai Pengxin Group Co. Ltd. (CN)	64,256	60,000		N
Others		109,434	357,466	540	-
Subtotal		1,643,033			
Domestic		743,331			
Total		2,386,364	2,181,058	3,440	

Sources: [Trase 2017](#), [SICARM](#), [ABIOVE](#)

Glencore, Granol, CHS, Agrex, Fiagril, and Cargill are the lead traders in soy municipalities (over 20,000 ha of planted soy area) with the highest deforestation rates (Figure 10). These companies may be most exposed to financial risks related to deforestation in Tocantins.

Figure 10: Soy traders and deforestation rates in selected municipalities

Municipality	Main soy trader	Deforestation (ha)
Lagoa da Confusão	Glencore	4,127
Porto Nacional	Domestic	3,581
Peixe	Granol	3,510
Monto do Carmo	CHS	3,431
Mateiros	Agrex	2,860
Santa Rosa do Tocantins	Fiagril	2,045
Campos Lindos	Cargill	1,932

Source: [Trase 2017](#), [Prodes](#) and [GLAD alerts](#)

Brazilian agribusinesses with crushing capacity have no commitments on deforestation

Soy crushers in Tocantins are a potential source of leakage for unsustainable soybeans. All [soy crushing capacity](#) in Tocantins is in the hands of three Brazilian companies that have no commitments to eliminate deforestation from their supply chains.

Granol's industrial unit in Porto Nacional is the largest crusher operating in an area with [high deforestation rates](#). [Granol Indústria, Comércio and Exportação S/A](#), founded in 1965, is engaged in production and commercialization of beans, soybean meal, vegetable oils, and biodiesel in Brazil and internationally. The Porto Nacional unit [expanded](#) its biodiesel operations with soybean crushing in 2015, with a crushing capacity of [2,900 tons](#) per day. Granol's soy warehouses in Aguiarnópolis, Figueirópolis and Guaraí [predominantly supply](#) the processing unit in Porto Nacional. In June 2016, the Granol processing unit was temporarily [out of operation](#), due to a domestic shortage of soybeans and vanishing profit margins.

A second soybean crushing plant [Nutrifico](#), owned by Grupo Focoagro, was inaugurated in the municipality of Guaraí in October 2017. With a soybean crushing capacity of 160 tons per day, it is relatively small. [Fazendão Agronegócio](#) owns the third soybean-crushing unit in Cariri do Tocantins, with a capacity of 380 tons of soybeans per day.

Case Study: Lagoa da Confusão most affected by soy-related deforestation

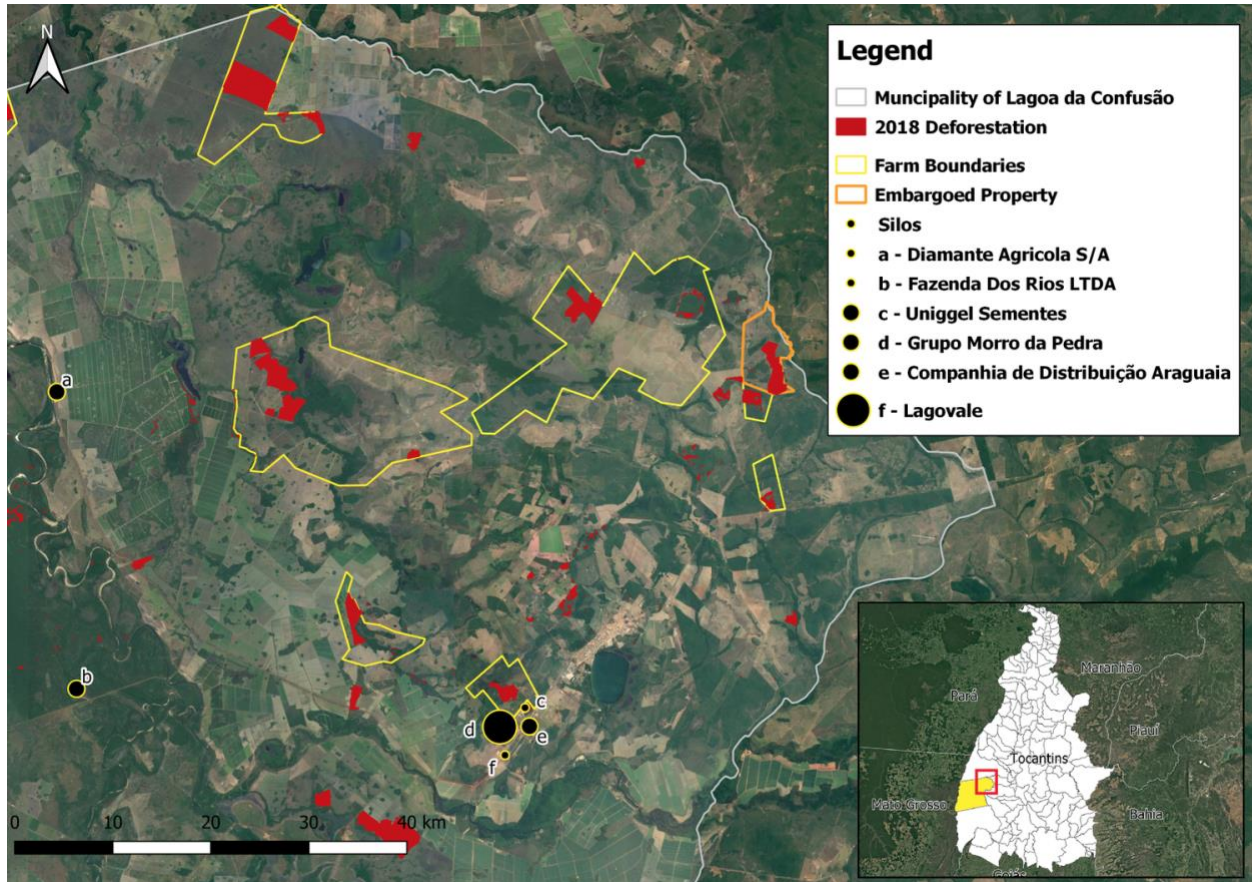
Lagoa da Confusão is among the main soy-producing municipalities and is one of the areas most affected by deforestation in 2018. Lagoa Da Confusão produced [121,432 metric tons](#) of soy on 40,130 ha of land in 2017. A total of [4,127 ha](#) was cleared in in 2018 ([Prodes](#) and [GLAD](#)), of which 40 percent was classified as “Alluvial Semi Deciduous Seasonal Forest” and 13 percent as “Forested Savanna” by the [Brazilian Ministry of Environment](#). The remaining 47 percent consists of grassland formations. Sixty-eight percent of the municipality is protected as a national park.

Soy and rice are the key agricultural crops grown, in a [rotational system](#). Soy producers and warehouses are highly concentrated in the northeast section of the municipality (Figure 11). With [68,690 metric tons of capacity](#), Grupo Morro da Pedra owns the largest warehouse facility in the municipality (Figure 12). Its [founders](#) and their family own 43 properties (12,415 ha) in the municipality and directly next to its border.

Glencore is the largest exporter of soy from Lagoa da Confusão. The company accounted for [82.9 percent](#) of the total soy exports in the municipality in 2017, with volumes mainly shipped to China.

At least one farm in Lagoa de Confusao has foreign investors. The [U.S.-Brazilian joint venture](#) is an investment of the [Harvest Capital Group LCC](#), founded in 1996 by “two farmer families who wanted to invest in agricultural production in South America seeking for [cheaper land](#).” Harvest Capital invested [USD 32 million](#) in Fazenda Dois Rios Farm in the municipality.

Figure 11: Deforestation and ownership in Lagoa da Confusão



Source: [Trase 2017](#), [Prodes](#), [GLAD alerts](#), [Incra](#), [SICARM](#)

Figure 12: Warehouse facility of Grupo Morro da Pedra in Lagoa da Confusão



Source: [Grupo Morro da Pedra](#)

Deforestation, embargoes, fines, and social issues in the municipality

Illegal and legal deforestation took place in Lagoa da Confusão in 2018. Twenty-six percent (1,077 ha) of the 2018 deforestation took place on 5 different farms shown in Figure 11. One of these farms (Fazenda Macaúba) is recorded in the IBAMA list of [embargoed areas](#).

Forty-eight properties in the municipality, totaling 2,583 ha, are under embargo by [IBAMA](#). Nearly half of these embargoes are linked to illegal deforestation in protected areas or in areas where authorization is pending.

In addition, IBAMA fined nine companies and farm owners for deforestation in 2018, totaling nearly [BRL 12 million \(USD 3.08 million\)](#). Among them is Diamante Agricola S/A (see 'a' in Figure 11), the third largest warehouse facility in the municipality. The company received a [fine of BRL 6.2 million](#) (USD 1.6 million) in May 2018 for exploring or damaging native vegetation or planted native species.

Besides deforestation, land disputes and slave labor also likely occur in the municipality. For instance, Diamante Agricola S/A appears in the Transparency List on [Contemporary Slave Labor](#). In December 2018, two persons were murdered in the municipality, allegedly related to a [land dispute](#).

Zero-deforestation efforts in this municipality are relevant given that 67,097 ha of native vegetation could still be legally converted (outside the legal reserves).

Case Study: Campos Lindos under pressure for rapid land conversion

Soy is also the key crop grown in Campos Lindos, the municipality bordering Maranhão in the east of the state. In 2017, Campos Lindos produced [128,790 metric tons](#) of soy occupying a total of 40,500 ha of land. Warehouses of Brazil's major soy traders, including Agrex do Brasil, Cargill Agricola, Bunge Alimentos, and ABC Indústria e Comércio S/A, are concentrated in Campos Lindos (Figure 13). With [49,100 metric tons](#) capacity, ABC Indústria e Comércio S/A owns the largest warehouse facility in the municipality. Cargill is the second largest with 29,420 metric tons.

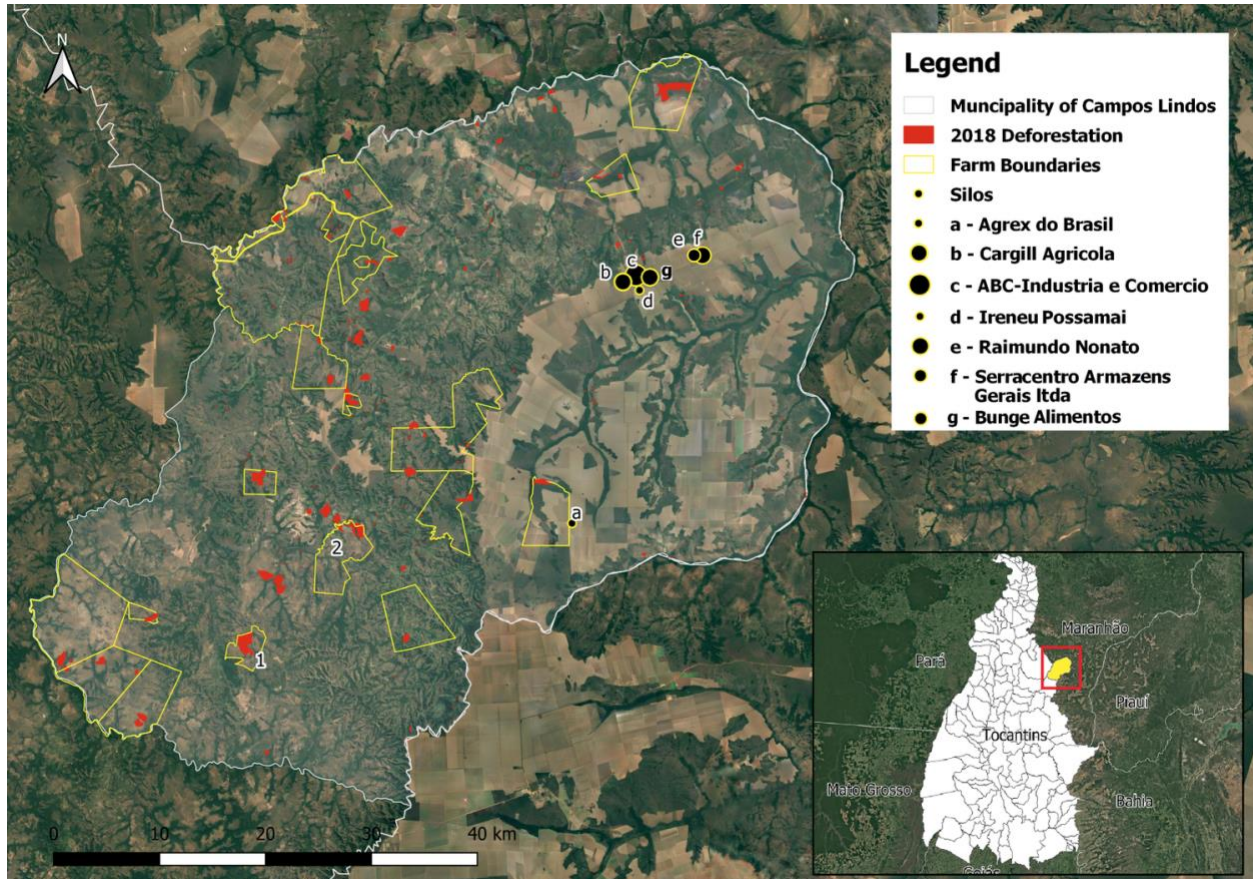
Cargill Agrícola is the largest exporter of soy in Campos Lindos. The company accounted for [95.7 percent](#) of the total soy exports in the municipality in 2017, most of which went to China. The company operates three silos in adjacent municipality Balsas in Maranhão.

Five farms are responsible for 22 percent loss of native vegetation

Five farms in Campos Lindos are responsible for 22 percent (431 ha) of the total deforestation of 1,932 ha in the municipality in 2018 ([Prodes](#) and [GLAD](#)). The [Brazilian Ministry of Environment](#) classified sixty-four percent of the loss is classified as forest. The remaining 36 percent is considered grassland formations. Deforestation is gradually shifting to the southwest of the municipality, where more development could still occur (Figure 13).

Nineteen properties in this municipality, totaling 2,075 ha, are under embargo by [IBAMA](#). Nearly half of them are involved in the removal of native vegetation in permanent preservation areas or legal reserves. Other properties were embargoed for destroying forests or other types of native vegetation without authorization of IBAMA.

Figure 13: Deforestation and ownership in Campos Lindos



Source: [Trase 2017](#), [Prodes](#), [GLAD alerts](#), [Incra](#), [SICARM](#)

Link between cattle from deforested farms and JBS and Masterboi slaughter facilities

A portion of the 2018 deforestation that took place on cattle ranches may be present in the indirect supply chain of large meatpacking companies JBS and Masterboi. Guia de Trânsito Animal (GTA) data that tracks cattle from the ranch to the slaughterhouse suggests that two farms (see 1 and 2 in Figure 13) have sent cattle for fattening to Fazenda Bebedouro in Itacaja (Tocantins). Cattle from this farm has in turn been supplied to Masterboi’s slaughterhouse in Nova Olinda (Tocantins) as well as to JBS’ slaughterhouse in Araguaína (Tocantins).

Masterboi’s slaughterhouse in Nova Olinda has not signed the legally binding [Terms of Adjustment of Conduct \(TACs\)](#) with Brazil’s federal government. Through these agreements, signatories have [committed to](#) buying cattle from only ranches free of Amazon deforestation since 2009. The Nova Olinda slaughterhouse [ranks](#) “high” regarding risks associated with deforestation based on the characteristics of the buying zones.

JBS, the largest meatpacker in Brazil and a TAC signatory, has the highest deforestation risk of all meatpackers that operate in the Amazon. Its Araguaína meatpacking plant has a [medium-high exposure](#) to deforestation risks.

Zero-deforestation efforts in this municipality are relevant given that 62,200 ha of native vegetation could still be legally converted (outside the legal reserves).

Soy from Tocantins may carry elevated risks for companies and investors

Zero-deforestation commitments for soy from the Cerrado have gained momentum. The [Cerrado Manifesto](#), published by civil society groups and supported by [74 large companies](#), urges supply chain actors to strengthen the implementation of their zero-deforestation commitments. In addition, a number of large [institutional investors](#) signed onto the Cerrado Manifesto. The signatories of this Statement of Support are looking to expand the Amazon Soy Moratorium to the Cerrado Biome, and negotiations with trading associations are currently underway.

Tocantins is one of the states where the risk of non-compliance with such commitments is elevated. Soy from Tocantins carries a high deforestation risk, both legal and illegal. Moreover, key actors in the soy value chains in Lagoa de Confusão and Campos Lindos have seen multiple environmental and socio-political controversies. It is highly likely that similar controversies also exist in other major soy areas in Tocantins.

The largest soy traders in Tocantins, including ADM, Amaggi, Bunge, Cargill, Cofco, Louis Dreyfus and Glencore, may face elevated deforestation risks in their Tocantins supply base. Deforestation in their supply chains may expose them to various business risks, including reputation risks, market access risks, stranded asset risk and cost of capital risk.

Beef retailers in Brazil may be exposed to deforestation risks in their indirect supply chains. Large beef retailers operating in Brazil include Carrefour, Cencosud and Casino/Grupo Pão de Açúcar. They all source supply in Tocantins and may therefore be exposed to heightened reputation risks present in non-transparent and indirect supply chains.

Enhanced implementation of zero-deforestation commitments may mitigate such risks. Such enhancements may include the disclosure of supply chain data, stricter enforcement of non-compliance mechanisms, and continuous monitoring of land use change, both legal and illegal.

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