

USDA Foreign Agricultural Service

# GAIN Report

Global Agricultural Information Network

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## **Brazil**

**Post:** Brasilia

## **Infrastructure Developments in Brazil's Northern Arc**

### **Report Categories:**

Market Development Reports

### **Approved By:**

Clay Hamilton

### **Prepared By:**

Nicolas Rubio and Rebecca Kirkpatrick

### **Report Highlights:**

Brazil is one of the largest agricultural commodity producers in the world and is continuing to expand its production. In 2016/2017, Brazil produced an estimated 98.5 million metric tons (mmt) of corn and 114 mmt of soybean, record levels for both crops. However, Brazil's infrastructure still lags behind other countries. Many of its main grain transport roads are still partially unpaved and very few railways are available for agricultural transport. Improvements to infrastructure are slowly being made and transportation costs have dropped in recent years, but there are still many areas that need to be improved for Brazil's exports to remain competitive, especially in Brazil's north and center-west regions.

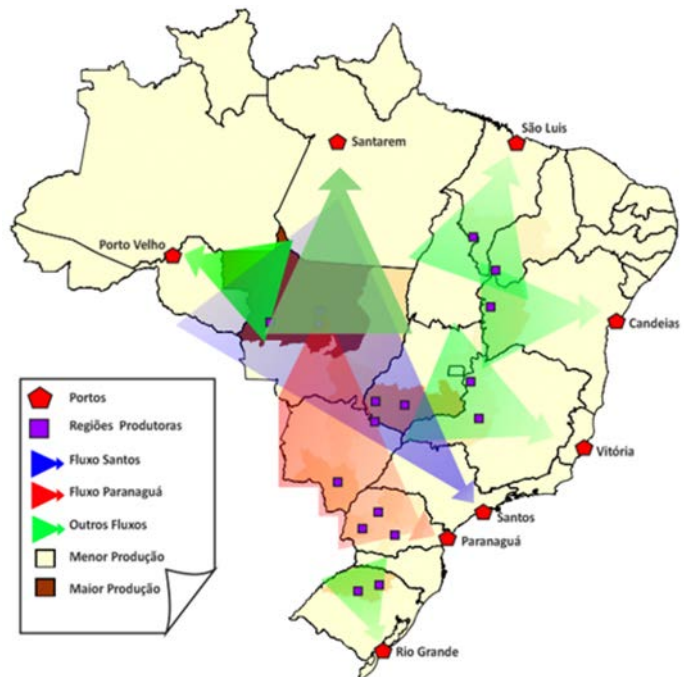
## General Information:

### *Overview of In-Country Grain Transportation:*

Brazil uses railways, roads, and waterways to transport grains and soybeans to its ports for export. According to the National Association of Grain Exporters, Brazilian roads accounts for approximately 60 percent of all grains/oilseeds cargo transportation, followed by railways at 30 percent, and waterways at 10 percent.

The map on Figure 1 shows the main transportation corridors for Brazilian grain and soybean exports. The red arrow represents the flow to the port of Paranaguá in the south. This port is extremely important because it captures a large portion of the production in southern Mato Grosso (MT), Mato Grosso do Sul (MS), and Paraná (PR). The blue arrow shows the transportation from the southern portion of MT to the Port of Santos, the most established port in Brazil. Many of the green arrows show the flow of exports from across the country to major Northern Arc ports, such as river ports in Porto Velho and Miritituba, which use barges to transport corn and soybeans to ports in Manaus, Barcarena/Belem, Santarém, and São Luis. The other green arrows show the flow of transportation out of the MATOPIBA, a region composed of the states of Maranhão (MA), Tocantins (TO), Bahia (BA), and Piauí (PI).

**Figure 1**



Source: Escola Superior de Agricultura Luiz de Queiroz (USP)

### *Northern Arc Ports in Brazil:*

Brazil's Northern Arc consists of river and ocean ports in the north and northeast regions of Brazil (see Figure 2). These ports are primarily located along the Amazon River, Tapajós River, and the Atlantic coast. It includes ports in the cities of Bacarena/Belem, São Luis, Recife, and Salvador. It also includes river ports in the cities of Porto Velho, Manaus, Santarem, and Miritituba.

Figure 2 - Northern Arc Ports



Source: ENGEMA

While the southern ports of Brazil (Santos, Rio Grande, and Paranaguá) export the largest quantities of agricultural products (as seen in Tables 1 and 2), the backlog, long distances, and increasing transportation costs of these ports have created a demand for more options for exporters. Much of the grains and soybeans that are being produced in northern Mato Grosso, the state of Pará, and the MATOPIBA region are increasingly using the ports in the Northern Arc. Over the past 5 years, the private sector has made significant investments in railways, roads, and ports in the northern part of the country to facilitate the transport of commodities to the north, but there is still a lot of progress to be made. However, the northern arc is increasingly becoming an important option for exporters and one that will only become more efficient over time.

**Table 1**

Brazilian Soybean Exports by Port (1,000 MT)					
Ports	2012/13*	2013/14*	2014/15*	2015/16*	2016/17*
<b>Southern ports</b>					
Santos (SP)	10,081	14,016	12,707	13,031	14,692
Port of Rio Grande (RS)	3,411	8,206	8,158	11,438	9,997
Port of Paraguana (PR)	6,698	7,739	7,584	8,785	8,110
<b>North and Northeastern Ports</b>					
Port of Sao Luis (MA)	2,751	2,975	3,116	5,004	3,850
Barcarena (PA)	0	0	1,110	2,185	2,187
Port of Manaus (AM)	1,298	1,291	1,398	1,653	1,974
Santarem (PA)	873	997	882	1,027	1,758
Port of Salvador (BA)	1,721	1,779	2,015	2,693	1,408
Ilheus (BA)	38	71	161	0	62
Total Exports from North and Northeast	6,681	7,113	8,682	12,562	11,239**
Total Exports in Brazil	31,868	43,930	45,743	54,632	52,105**

\*Local Marketing Year (February-January)

\*\* Drop due to lower supplies because of drought

Source: Secretariat of Foreign Trade (SECEX)

**Table 2**

Brazilian Corn Exports by Port (1,000 MT)					
Ports	2012/13*	2013/14*	2014/15*	2015/16*	2016/17*
<b>Southern Ports</b>					
Santos (SP)	7,233	16,493	8,879	10,714	11,385
Port of Rio Grande (RS)	199	441	1,020	1,026	194
Port of Paraguana (PR)	1,699	4,668	4,333	4,159	5,567
<b>North and Northeastern Ports</b>					
Port of Sao Luis (MA)	352	2,205	699	337	488
Barcarena (PA)	1,026	859	121	0	1,000
Port of Manaus (AM)	634	1,448	646	1,187	311
Santarem (PA)	373	1,893	855	1,311	563
Port of Salvador (BA)	0	0	97	78	21
Ilheus (BA)	0	53	27	105	217
Total Exports from North and Northeast	2,385	6,458	2,445	3,018	2,600**
Total Exports in Brazil	24,337	24,948	20,966	34,438	13,966**

\*Local Marketing Year (March - February)

\*\* Drop due to lower supplies because of drought

Source: Secretariat of Foreign Trade (SECEX)

Despite the fact that current transportation options may be expensive and inefficient, tables 3 and 4 (below) show agricultural production in Brazil continues to increase. In 2010, only 5 percent of Brazil's grains and soybeans exports left through the northern ports; however, exports increased to about 20 percent by 2015. Private sector grain traders, such as ADM, Bunge, Cargill, Group Amaggi, and others have witnessed this surge in production and responded in the last couple of years by building their own ports along the Amazon and Tapajós rivers. These private ports along the rivers, such as those in the town of Miritituba, allow companies to transport grains and soybeans in barges to ocean ports in Santarem and Barcarena. This allows for more efficient transportation of grains to these sea ports, furthermore the terminals along the Amazon and Tapajós rivers also reduce the stress on roadways in the north and the southern ports.

**Table 3**

Soybean Production in Selected Northern, Northeastern and Center-West States of Brazil										
Brazilian States	2012/13		2013/14		2014/15		2015/16		2016/17	
	Area (1,000 ha)	Production (1,000 MT)	Area (1,000 ha)	Production (1,000 MT)	Area (1,000 ha)	Production (1,000 MT)	Area (1,000 ha)	Production (1,000 MT)	Area (1,000 ha)	Production (1,000 MT)
Mato Grosso (MT)	7,818	23,533	8,616	26,442	8,917	28,134	9,140	26,031	9,322	30,513
Bahia (BA)	1,281	2,692	1,312	3,308	1,420	4,121	1,526	3,211	1,580	5,123
Tocantins (TO)	549	1,536	748	2,059	834	2,442	871	1,687	964	2,826
Maranhão (MA)	586	1,686	662	1,824	749	2,058	786	1,250	821	2,473
Piauí (PI)	546	916.9	627	1,489	673	1,833	565.0	645.8	693	2,048
Pará (PA)	172	552	221	669	322	978	429	1,288	508	1,634
Total production from the above mentioned states	10,953	30,916	12,187	35,791	12,916	39,568	13,318	34,113	13,891	44,619
Total Brazilian Production	27,736	81,499	30,173	86,121	32,092	96,228	33,251	95,434	33,925	114,042

Source: National Company of Food and Supply (CONAB)

**Table 4**

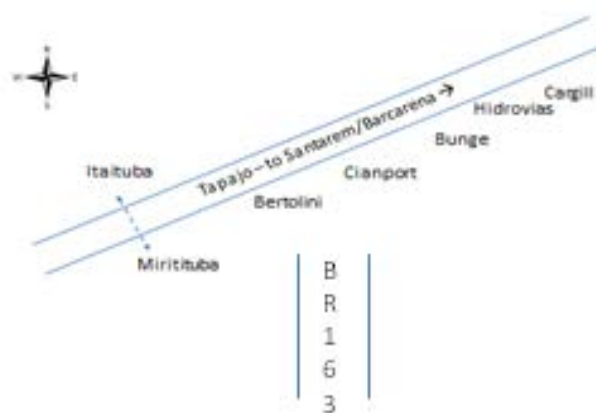
Corn Production in Selected Northern, Northeastern and Center-West States of Brazil										
Brazilian States	2012/13		2013/14		2014/15		2015/16		2016/17	
	Area (1,000 ha)	Production (1,000 MT)	Area (1,000 ha)	Production (1,000 MT)	Area (1,000 ha)	Production (1,000 MT)	Area (1,000 ha)	Production (1,000 MT)	Area (1,000 ha)	Production (1,000 MT)
Mato Grosso (MT)	3,425	19,893	3,298	18,049	3,313	18,961	3,800	15,272	4,489	27,699
Bahia (BA)	699	2,156	812.5	3,182	806	2,795	618	1,447	646.9	1,962
Maranhão (MA)	507	1,309	606	1,726	488	1,489	354	874	491	1,951
Piauí (PI)	379	542.80	405	1,029	406	1,063	492	739.50	467	1,384
Tocantins (TO)	95	448	151	684	207	1,013	168	540	201	902
Pará (PA)	199	566	184	537	218	705	196	647	259	845
Total production from the above mentioned states	5,305	24,915	5,457	25,208	5,439	26,027	5,629	19,520	6,555	34,745
Total Brazilian production	15,829	81,505	15,828	80,052	15,692	84,672	15,922	66,570	17,471	97,191

Source: National Company of Food and Supply (CONAB)

The most significant investments in the last 3 years have taken place in river ports in the the state of Pará. Multinational companies like ADM, Cargill, Bunge, and others have invested in private terminals to transport grains out of northern Mato Grosso to river ports in Porto Velho and Miritituba. Using barges that can move up to 50,000 metric tons (mt) in one trip compared to 40 mt by truck, these companies are utilizing the Amazon and Tapajós rivers to connect with ocean ports in Santarem and Bacarena. For example, Miritituba, a small city on the Tapajós River, has received over 1.5 billion dollars in investments since 2014 and is home to six new privately owned terminals that use barges to move commodities along the river. This gateway was created to facilitate the export of the increasing production in northern Mato Grosso and improve export competitiveness for markets in Europe, Mexico, the Middle East, and Asia. These terminals are projected to move roughly 4.5 mmt of corn and soybeans in 2017 by barge to ocean ports in Barcarena and Santarem. The volumes out of Miritituba are expected to reach 11 mmt annually by 2021.

Miritituba even has a floating terminal to load barges, the only one of its kind in northern Brazil. This type of operation could become more common in the coming years. The cost of a floating terminal is a quarter of the cost of a permanent terminal, but it can handle almost 90 percent of the daily (about 400 trucks/day) grain capacity of a permanent facility. The floating terminal also has the ability to move along the Tapajós River as needed. The cost savings on this type of terminal could be enough to influence other trading companies to invest in this type of infrastructure in the future.

**Figure 3 –Terminals in Miritituba**



Source: Texas A&M University

Heavy investments in ocean ports have also improved logistics in the Northern Arc. Until recently, highway BR-163 was the main corridor to transport grains and soybeans to the port of Santarem. Today, due to the recent investments by multinationals, a majority of the grains and soybeans are trucked to Miritituba and then transported via barges to Santarem. One barge convoy can take 1,250 more corn/soybeans in one trip than one truck. This change has reduced truck transportation times by at least 6 hours as well as transportation costs.

One challenge that remains in using the port of Santarem is the shallower depth of the Tapajós River's channel into the Atlantic Ocean, which prevents Panamax ships from being fully loaded. Some projects are already underway to fix this issue, but some multinational grain traders have invested in another ocean ports in Barcarena. Today, barges from Miritituba and Porto Velho can travel all the way to Barcarena, where the water is deep enough to handle fully loaded Panamax vessels.

Large trading companies also see the growing infrastructure need to serve the MATOPIBA region, which has led to significant investments into another key ocean port in the Northern Arc. Since 2015, four companies are operating grain loading facilities in the port of São Luis. Currently, those four companies have capacity to load 5 mmt, but the goal is to double that capacity by 2020. The port in São Luis also has an advantage compared to Barcarena and Santarem as grains can be delivered by railroad. Trains with up to 160 cars can connect the state of Goias and the MATOPIBA region to the port in São Luis. However, a challenge that remains for this port is competition for cargo space with mineral exports, because Brazil's main mining company operates the railroad.

### *Unfinished Projects in the Northern Arc of Brazil:*

#### *BR-163*

BR-163 is the main road that carries grains and soybeans from the northern part of the state of Mato Grosso to the ports of Miritituba and Santarém. This road still has about 56 miles (90 kilometers) that is unpaved. It is expected that 60 km will be paved by the end of 2017 and the final stretch will be paved by the end of 2018. When BR-163 is fully paved, transportation efficiency will increase dramatically, especially during the rainy season. However, finishing the pavement is only the first step for BR-163 as it is primarily a two-way road and maintenance is a constant problem.

#### *Ferrogrão Rail*

The Ferrogrão railway will run parallel to BR-163 and link the grain-producing center-west with the river port of Miritituba. However, it is not clear when the project will be approved and when construction on the railway will begin. This railroad plans to connect north of Mato Grosso, starting from the city of Sinop, a main growing region. It will span 714 miles (1,142 kilometers) and have capacity for 42 million MT a year once it reaches full capacity. This project is expected to increase transport capacity and competitiveness to the corridor and alleviate traffic bottlenecks. In addition, it is expected to backhaul fertilizers to producing areas in Mato Grosso. Once built, it is estimated that the transportation cost per ton of corn and soybeans will decrease from about US\$40 to US\$25 per metric ton. A consortium formed by commodities traders ADM, Cargill, Amaggi, Louis Dreyfus, and Bunge, is behind this investment opportunity.

#### *Trans-Northeastern Railway (TNR)*

The Trans-Northeastern rail (TNR) was launched in 2005, but work was halted in 2012 and has not resumed. This railway is designed to connect Pecem and Recife/Suape to Salgueiro and will connect with other smaller railways along the way. Currently, the Brazilian government is waiting on the contractor, ANTT, to submit an updated budget before allowing construction to continue.

#### *North-South Railway*

The North-South railway will run parallel to the Belém-Brasilia highway and the Tocantins River. It will link Senador to Belém, Anapolis with the Central Atlantic Railway, and Carajas Railway through Acailandia. This railroad will pass through four states: Tocantins, Goiás, Minas Gerais, and São Paulo. In 2016, over 90 percent of the infrastructure had been completed for this railway and the 530 miles (850km) between the National Port-Palmas in Tocantins and Anápolis was completed and authorized for commercial transportation.