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North and Northeast Brazil Port Infrastructure Report

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Competitor
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Grain and Feed
Oilseeds and Products

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Report Highlights:
The FAS team traveled to the North and Northeast of Brazil to review progress in infrastructure critical to making Brazilian agricultural exports, especially corn and soybeans, more competitive. The results of the trip are mixed. Progress has been made but much remains to be done before this export corridor achieves its full potential.

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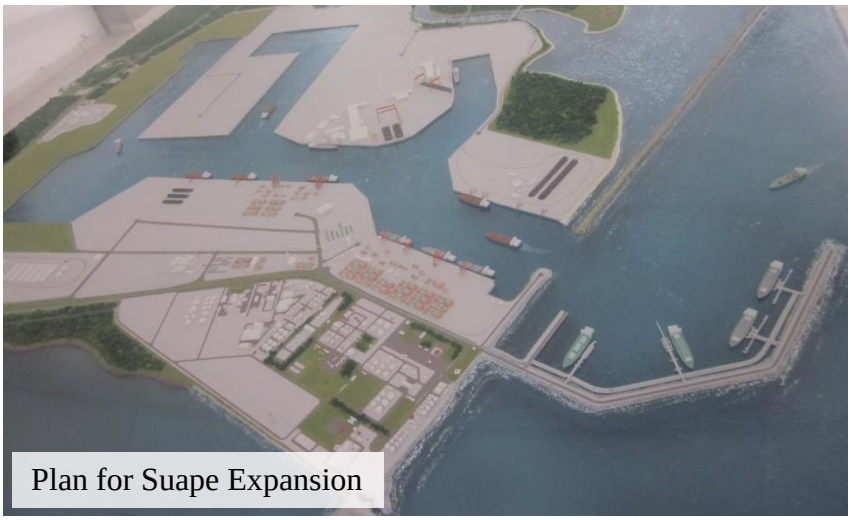
Introduction

The FAS team traveled to the North and Northeast of Brazil (Recife, São Luis, and Belem: see Appendix II) to review progress in infrastructure. Infrastructure development is critical to making Brazilian agricultural exports, especially corn and soybeans, more competitive. The results of the trip are mixed. Grain exporters are keenly aware that ports and infrastructure in the North and Northeast offer logistical advantages that will make exports more competitive. These exporters are investing heavily. Nevertheless, much remains to be done to conclude some projects and even commence others.

Suape Port

FAS team members began their infrastructural project tour in the state of Pernambuco, located in Brazilian Northeast (9 states with a total population of 53 million inhabitants). Pernambuco has 9.2 million inhabitants, making it the second most populous state of the Northeast. The FAS team visited the port of Suape, located in the Ipojuca, about 25 miles (40 kilometers) to the south of Recife, capital of the state of Pernambuco. Suape, one of Brazil's most important and best managed ports and upcoming industrial/trade complexes, was inaugurated in 1978 by then Chief of State General Ernesto Geisel. At the time, it was emblematic of the infrastructural projects championed by the military governments of that era (1964-1985). As early as the 1950s, though, Suape had been contemplated as a prime port location given the natural reef that protects the harbor, together with its proximity to Recife.



Plan for Suape Expansion

Over the last decade, Suape has been the target of billions of dollars of public and private sector investment and has been a key factor behind the rapid growth rate of the state of Pernambuco. The port/industrial complex of Suape occupies 13,500 hectares and currently houses investments from 105 companies which run a gamut from the government controlled oil company Petrobras to consumer food enterprises. Another 45 companies are planning to begin operations in the Suape complex. At present, it is estimated that developments in the Suape complex have created 25,000 jobs. Investments have supported, among others, the construction of shipyards, the biggest wheat mill in South America, and bulk refined sugar and container terminals. Fifty-nine percent of the Suape complex is an ecological preserve and at the same time, even maintaining this percentage, there is ample area for industrial expansion.

The Port of Suape has a privileged location since it is in the middle of the Northeast and next to Recife, one of Brazil's most dynamic distribution centers. Ninety percent of the GDP of the Northeast is located within a 500 kilometer radius of Suape. It is also relatively close to the Panama Canal and major markets in Europe, the U.S. and Africa.

Construction in Foreground and Wheat Mill in the Background

Much Available Area for Land Expansion

Suape is slated to be one of the termini of the Trans-Northeastern Railway (please see below), which when completed, will connect the port to southern Piauí, which is located within the Brazilian agricultural frontier and is already a major producer of soybeans and corn. This railway connection to Suape will increase Brazil's agricultural competiveness, in conjunction with the construction and opening of other Brazilian ports in the Northeast and North. Already, a significant percentage of the Northeast's fruit exports, much of which originates from the Petrolina area in the interior of Pernambuco, is shipped out of Suape.

Trans-Northeastern Railway

As mentioned above, one of the crucial means of transporting soybeans as well as minerals and other commercial goods from the interior of the Northeast to the port of Suape will be through the Trans-Northeastern Railway (TNR). The TNR is a public-private partnership, an investment initially valued at US$3.4 billion shared by the government-owned Northeast Rail Company, the privately owned National Steel Company (CSN), and the state governments of Pernambuco, Ceará, and Piauí. This partnership was launched in 2005 with CSN agreeing to front 25 percent of the investment capital with the rest coming from, in the main, government investment funds and banks. The TNR was originally projected for completion in 2010.

The entire length of the TNR is 1,089 miles (1,756 kilometers). Shaped as an "inverse T", the northern extension of the railway is envisioned to connect the port of Pecém , located the state of Ceará, to a line in the south, which will run from Eliseu Martins, Piauí in the west, to the port of Suape, in the east, 40 kilometers to the south of Recife. The northern line will intersect the southern extension in Salgueiro, Pernambuco, which is planned to serve as a logistics hub. The TRN is also planned to be linked with existing railways with the expected results of decreasing transportation costs for minerals and agricultural goods and of stimulating investment in one of Brazil's poorest regions. The promise embodied in this investment, however, has frequently been overshadowed by cost overruns, construction delays, and other difficulties.

In August 2012, the Agricultural Counselor paid a call on the Pernambuco State Secretariat of Economic Development (PSSED) to get a better understanding of some of the challenges which builders of the TNR were facing. In this meeting, he was told that of the three states in which the TNR was being constructed, progress in Pernambuco was the most advanced. However, coordination with federal authorities involved in the process had been challenging at times, especially in the execution of eminent domain. In Piauí and Ceará, legal challenges, limited administrative capacity, and shortfalls in investment capital had led to the halting of TNR construction. Even with the relative progress in TNR construction experienced in Pernambuco, PSSED officials admitted that the target date for completion of TNR construction within Pernambuco had been pushed back to 2015. They pointed out that until TNR construction is completed, the port of Suape would not be able to function in the way which planners initially envisioned, that is, as a major export platform.

In September 2013, the FAS team paid a call on PSSED officials to get an update on progress in the construction of the TNR. PSSED officials opined that expectations which surrounded the TNR were unrealistic and that there were many issues which had gotten in the way of an expeditious completion of this key infrastructural project. While underlining that Pernambuco would be a key beneficiary of the TNR since it would be used to transport minerals from the western part of the state to the port of Suape, officials offered that work on the TNR had essentially come to a halt in December 2012. They added that the Brazilian company which had won the bid to build the railway had just terminated its contract with CSN and had not yet been replaced. PSSED officials also emphasized that cost overruns continued to represent a major challenge to the completion of the TNR.

With regard to the TNR and its connection to the port of Suape, PSSED officials stated that the sections of the railway in Pernambuco closest to Suape had been the most problematic in advancing due to their passing through heavily populated areas, some of which were prone to flooding. When forced to alter the route, the Brazilian Environmental Institute (IBAMA) had not accepted the first environmental impact study which meant that work could not proceed. PSSED officials calculated that the new plan which was under IBAMA review would probably move more quickly since the Brazilian government (GOB) had recently placed a high priority on advancing major infrastructural projects such as the TNR. When queried about the new projected completion date, PSSED officials responded that 2016 was the new target for the Pernambucan portion of the TNR (about 450 miles or 725 kilometers). When asked about the coordination among Piauí, Pernambuco, and Ceará state governments to expedite TNR construction and maximize efficiencies, PSSED officials stated that this was not a practice.

Visit to Maranhão State Secretariat of Agriculture, Livestock, and Food Supply

After their visit to Pernambuco, the FAS team traveled to São Luis, the capital of the state of Maranhão. Maranhão is the second biggest state in terms of area in the Brazilian Northeast, and encompasses 332,000 square kilometers. Maranhão has a population of 6.79 million inhabitants, which is the fourth largest in the Northeast. Although the focus of this trip to the Northeast's most northerly state, Maranhão, was on the port of Itaquí, outside of São Luis, the FAS team took the opportunity to get updated on the dynamics of Maranhão's agricultural sector and paid a call on officials of the Maranhão State Secretariat of Agriculture, Livestock, and Food Supply (SAGRIMA).

Maranhão, although the poorest state in Brazil, has an agricultural vocation that is making a significant contribution to the economy. SAGRIMA officials asserted that agriculture accounts for 17 percent of the state's GDP. Maranhão, for example is the Brazil's number three rice producing state after the southern states of Rio Grande do Sul and Santa Catarina. It has the second largest area planted to rice in Brazil. Rice is cultivated mainly in the lowland area of Maranhão and has a growing season of 90 days. For 2012/2013, rice production reached close to 496,000 tons based on an area planted of 416,000 hectares. Rice began to be planted in Maranhão in the mid-1950s by Northeasterners who had been displaced by the Great Drought of 1954/55. Rice production reached 1.2 million tons by the 1960s but when the Brazilian livestock industry began its migration to the north in the 1970s, rice was eventually substituted for cattle. SAGRIMA officials underlined that there is a significant potential to expand irrigated rice production in Maranhão. Officials also noted that Maranhão has the highest per capita consumption of rice in Brazil.

Maranhão growers are also expanding production of soybeans and corn in the southern, tropical savanna ("cerrado") portion of Maranhão. For 2012/2013, close to 1.69 million tons of soybeans were produced on a planted area of 586,000 hectares making Maranhão the ninth largest soybean producing state in Brazil. For 2012/2013, corn production reached over 3.59 million tons planted on close to 1.63 million hectares. As Itaquí port infrastructure expands (please see below) and transportation to the port improves, there will be a greater impetus to ramp up oilseeds and grains production, given the relative proximity of production areas to port.

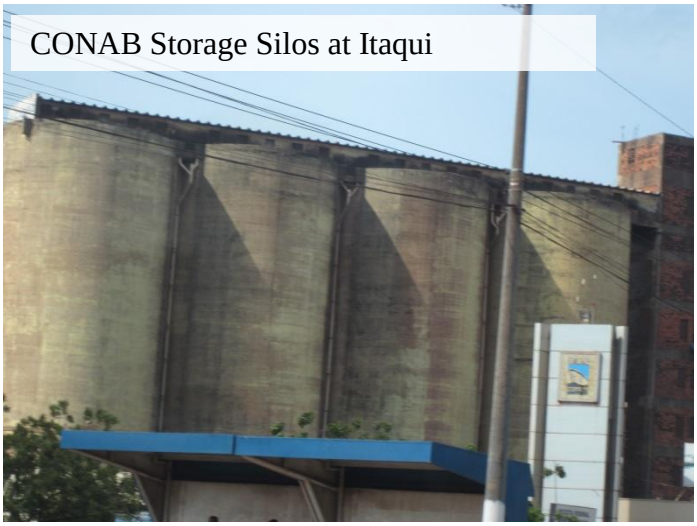

FAS Team Meeting with SAGRIMA

SAGRIMA officials, while recognizing the progress achieved in harnessing the potential of the tropical savanna region, pointed to a multiplicity of challenges that growers faced in Maranhão. Given the implementation of the new federal Forest Code which stipulates the percentage of land in different biomes which must go into a legal reserve, Maranhão urgently needs to be zoned. In the Amazon biome, for example, only 20 percent of the available land can be used for agriculture; 80 percent must go into a legal reserve.

Officials stated that the amount of land in Maranhão which is designated tropical savanna with a much smaller legal reserve of 35 percent, for example, is unknown. The biggest challenge facing Maranhão growers, SAGRIMA officials asserted, is the availability of technology. SAGRIMA officials noted, though, that the internationally renowned Brazilian Agricultural Research Corporation (EMBRAPA) had recently opened up a research station in Maranhão so prospects for improvement in technology availability and transfer were more promising. SAGRIMA officials underscored that in addition to oilseeds and grains, Maranhão had significant potential in the production of African palm oil, rubber, cacao, eucalyptus, and acai.

Itaquí Port, São Luis of Maranhão

Itaquí, located on the outskirts of the city of São Luis holds a privileged position due to its location along the northern coast of Brazil. The port is privileged because of its draft and because of an existing railway that connects the port with southern Maranhão, with the states of Pará and Tocantins. With further investment, this railway will penetrate the agriculture rich state of Goiás. At the port, the FAS team visited with a grain trader consortium, with Companhia Vale do Rio Doce, "Vale" (a mineral extraction company and Brazil's largest company, with significant investment in domestic infrastructure), and with the Itaquí Port Authority (EMAP).

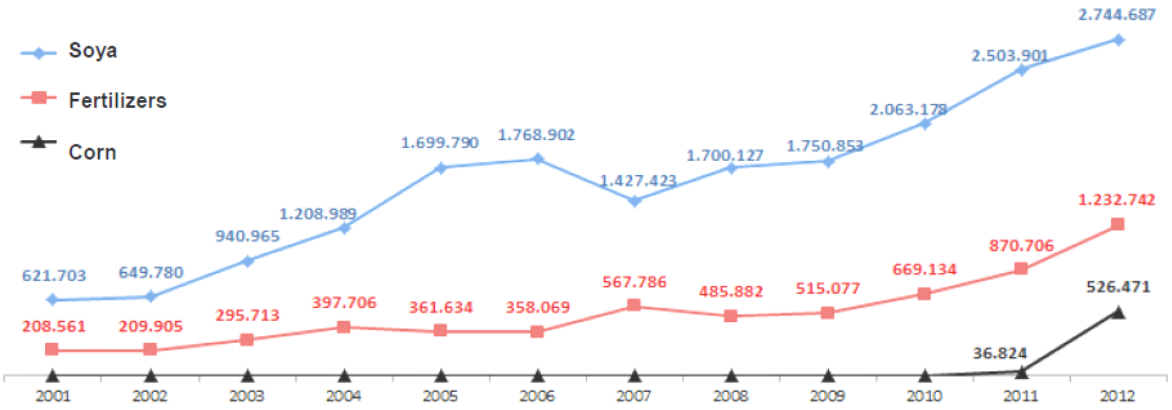

CONAB Storage Silos at Itaqui

The grain trader consortium, composed of U.S. multinational companies and Brazilian companies, emphasized that the public port of Itaquí—in conjunction with the private port, Ponta de Madeira, owned by Vale—should have a long-term exporting capacity of 15 mmt. The new grain terminal that is currently being built will have a planned export capacity of 10 mmt. The construction of phase one will conclude in April 2014 and will support the exportation of 5 mmt per year. The second phase, which will allow the port to export an additional 5 mmt should be finished in 2018. Central to this initiative, the consortium is building four warehouses, each with a 120,000 mt capacity. The warehouses will all have their own distinct systems for receiving truck loads but they will share a single system for receiving train loads. The port will be able to load ships at a rate of 2,500 mt/hour. The North-South Railroad ends at nearby Ponta de Madeira. One problem yet to be resolved is who will pay for the short stretch of tracks to connect the rail line to Itaquí. At this point it appears


Construction of Storage for the Grain Consortium

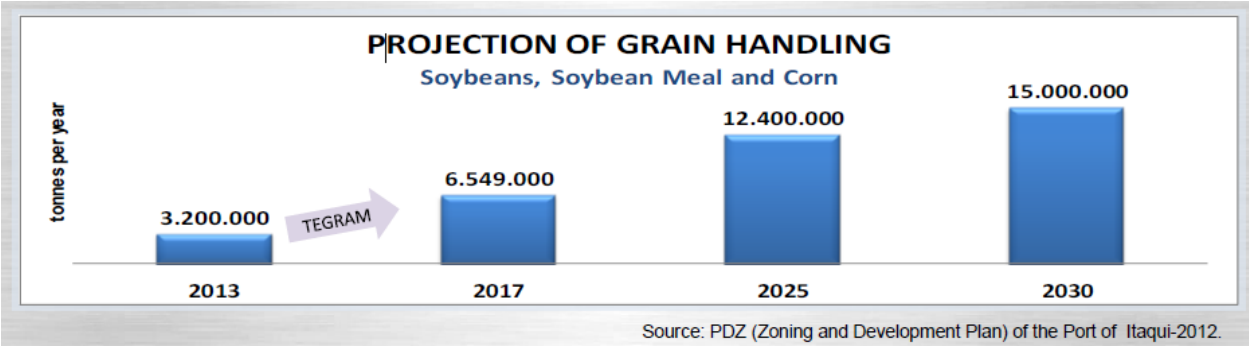
that the federal government will be footing the cost and construction will be completed by 2015. Even when the tracks reach the port, the grain trader consortium recognizes that Vale, as the operator of its private rail line, will keep a cap (currently 2.5 mmt/year) on how much rail it devotes to grain, as Vale's prime interest is mineral extraction, and movement and logistics (for grains and other products) not its primary focus. Truck shipments will complement the incoming rail cargo.

Graph 1: Historical Export Trends of Grain and Fertilizer from Itaquí Port



Source: Itaquí Operating Report – Cargo Handling History

Graph 2: 2013-2030 Grain Handling Projection from Itaquí Port



Source: Itaquí Operating Report – Cargo Handling history

The grain trader consortium noted that the large-scale investment at the Port of Itaquí makes sense with soybeans priced at US$12/bushel. However, while the United States or Argentina can weather lower prices, US$12 is the price point for Brazil because of the difficult transportation logistics, both for domestic transportation as well as for international export.

Vale's Ponta de Madeira Port, São Luis of Maranhão

Grain Elevator fo

Vale has separated a part of its company into a subsidiary, VLI, to handle its logistics. VLI operations are extensive in Brazil but focus on exporting raw products out of the ports, from as far north as Ponta de Madeira (São Luis), and all along the Brazilian coastline, as far south as Santos (Sao Paulo). VLI believes that Ponta de Madeira is strategically located and it is poised to greatly increase its soybean and corn exports. As soybean exports have grown 21 percent year-on-year between 2002 and 2012 in the region of MAPITOBA (the states of Maranhão, Piauí, Tocantins and Bahia), VLI hopes to capture this export industry with its transportation and port infrastructure. VLI is building a new grain terminal at Ponta de Madeira. To increase its workload potential, VLI is purchasing 65 new locomotives and 3,400 new rail cars, and constructing two new terminals along its rail line. VLI also plans to double-stack containers on its railcars to increase the amount of grains and other products it transports.

Vale's Grain Transportation Belt to Vessels

One of Vale's Storage Warehouses

The North-South Railroad links São Luis to the hinterlands of Maranhão, and the states of Pará, Piauí, and Tocantins. It currently extends as far south as Porto Nacional (Palmas, TO). The project that connects the line to Anápolis, Goiás, is due for completion in mid-2014. Thanks to this export corridor, Itaquí exported 2.1 mmt of grains in 2010, 2.6 mmt in 2011, and 3.1 mmt in 2012. With the connection at Anápolis, VLI anticipates exporting more meat products out of the Center-West (especially from Goiás and Mato Grosso), where many slaughterhouses are located. Due for completion in 2014, a second, parallel train track is under construction for the railroad that connects São Luis to eastern Pará, known as the Carajás Railroad (EFC Carajás). While the rest of the North-South Railroad runs on a single track, VLI is increasing the number of passing sidings along the North-South Railroad to maximize the haul along the single track in both directions.

The public port of Itaquí is administered by the public port authority EMAP. The port has a minimum draft of 23 meters and has seven piers already constructed. As EMAP has recognized the essential

demand of haul-back for new ports coming on line for agricultural exports, a fertilizer terminal is being constructed and will be ready for operation by 2017. Ports have noted that unless truck drivers are guaranteed a return shipment to the point of origin (or contracting), they may have to return with an empty load. This guarantee has proven itself a challenge since most of the imports needed in agricultural production areas have established import channels: the essential ag-related imports are entering Brazil through the southern ports of Santos and Paranaguá. Annual fertilizer imports are projected to reach 5 mmt by 2023. In 2012, fertilizer imports totaled 1.3 mmt at Itaquí. In addition to plans to augment the number of piers, EMAP is planning to widen many of the piers to allow for an easier flow of traffic and cargo movement.

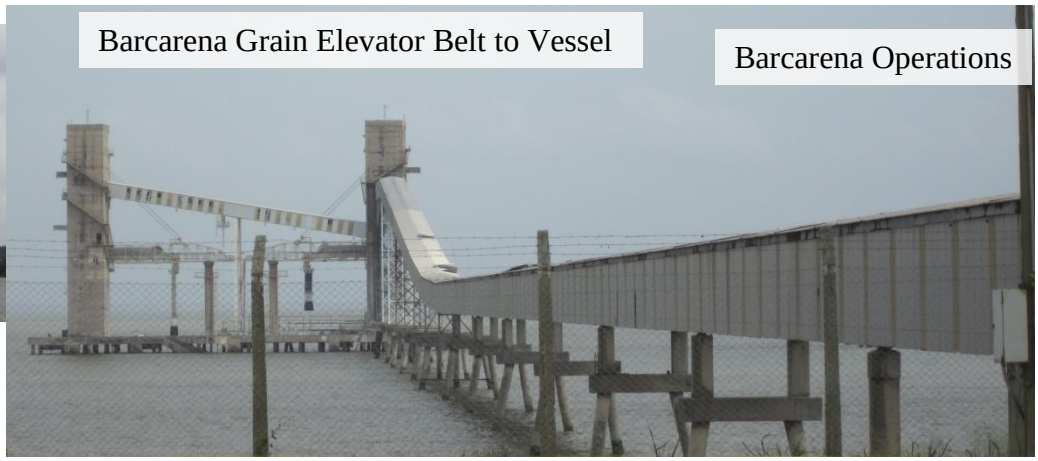
Itaquí enjoys the logistical advantages of being closer to Europe and of having deep waters. It takes 10 days to travel from Itaquí to Rotterdam, whereas the shipping time from Santos to Rotterdam is 17 days. The port's deep waters allow for the loading and unloading of VLI's Valemax ships (also known as Chinamax), among the world's largest, which can carry 400,000 mt per load.

Table 1: Distance in Nautical Miles from Select Brazilian Ports—with Itaquí highlighted—to Select Foreign Destinations

	Itaqui (MA) Nautical miles	Salvador (BA)	Tubarão (ES)	Rio (RJ)	Santos (SP)	Rio Grande (RS)
Rotterdam (NL)	4.143	4.913	5.393	5.673	5.893	6.499
Hamburg (DE)	4.419	5.189	5.669	5.949	6.169	6.775
N. Orleans (USA)	3.355	4.735	5.215	5.495	5.715	6.321
S. Francisco (USA)	5.767	7.147	7.626	7.906	8.126	8.732
Canal do Panamá	2.483	3.862	4.342	4.622	4.842	5.448

Barcarena Port, near Belém do Pará

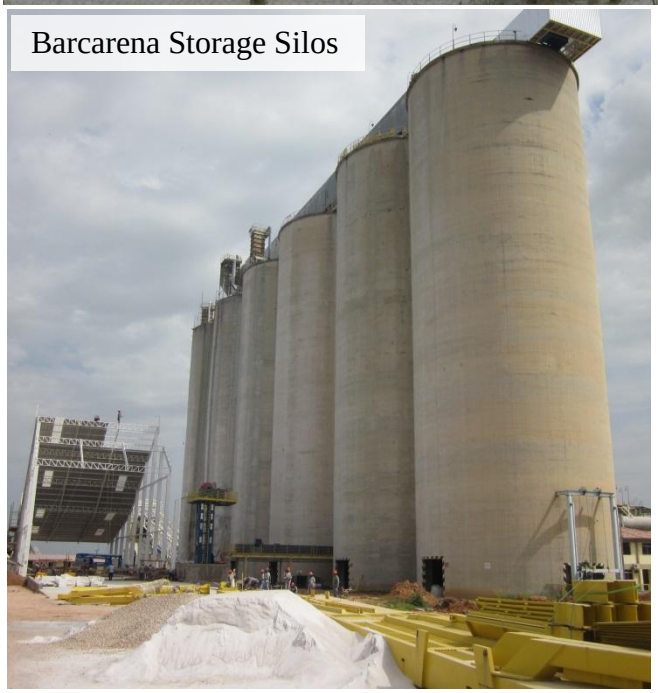
The FAS team visited a grain trader that is setting up operations in Barcarena. Barcarena is a private port located across a river channel from Belém, the capital of the northern state of Pará. Belém is strategically located at the mouth of the Amazon River and enjoys many of the location advantages that São Luis has. In addition to the private port at Barcarena, the greater-Belém area is the location of the neighboring public port, Vila do Conde, the public port of Belém, and the terminal of Outeiro.



Barcarena Grain Elevator Belt to Vessel

Barcarena Operations

The port at Barcarena will be able to receive grain cargo from rail, roads and waterways. The grain terminal is currently under renovation. Current storage capacity is at 30,000 mt, but two new storage units are being constructed that will bring total storage capacity to 148,000 mt. The port's current grain receiving rate is 600 mt per hour, and the ship-loading rate is 2,000 mt per hour. The port will be ready to load its first Handymax vessel in January 2014. With dredging work underway and projects to widen the berth, by 2015 the port will be able to accommodate Panamax vessels. The port is ready to receive grain shipments by waterway and by road. The rail project that connects Barcarena to Açailândia, Pará, is scheduled for completion in 2019. The trader anticipates grain exports at Barcarena to reach 1.1 mmt in 2014 and hit full export capacity at 6 mmt by 2019. By the possible construction of a second berth, there will be enough space at the port to double export operations, with a prospect of reaching 12 mmt per year. The trader also has a warehouse equipped with big-bag pack distributing fertilizer through back haul.



Barcarena Storage Silos

Barcarena's Grain Transportation Belt to Vessels

Vila do Conde Port, near Belém do Pará

The FAS team visited the public port, Vila do Conde, which is adjacent to the Port of Barcarena. Another grain trader is currently operating at Vila do Conde and is exporting 6 mmt per year of grains, primarily soybeans. The port has additional pier space available should other grain traders decide to invest in a grain export terminal. Brazil also exports live cattle out of Vila do Conde, with Venezuela, Lebanon, and Egypt as its primary export destinations. The typical vessel for livestock export carries 7,000 head of cattle.


Vessel being Loaded with Cattle at Vila do Conde

The grain traders operating out of Belém emphasized that, while São Luis has some logistical advantages, they preferred the autonomy in transportation that Belém offered. Instead of depending on the logistics of third-party transportation operators at São Luis, the grain traders at Belém said they want further control over which transportation modalities are used, which companies are contracted, timetables, and rates. Depending on the region of the country, this has been a concern for grain traders competing for transportation logistics that are already stretched thin.

Oil Palm Plantation Field Visit

The FAS team visited Archer Daniel Midland's (ADM) African oil palm plantation in eastern Pará. Palm oil in Brazil is destined primarily for the cosmetic industry, as Brazil is the second largest user of cosmetics in the


Drive through the Amazon Forest to Reach Oil Palm Fields


Field of 3-Year Old Oil Palms

world. A secondary destination is for commercial food production. Some palm oil is used in the biodiesel market, but currently market prices are better for palm oil in the cosmetic and food sectors. Oil palm is a perennial crop with a 20 to 30 year lifespan. The African palm fruit from which the oil is extracted can be harvested after four years and production peaks in the tenth year. Production measured in fresh fruit bunch varies from 22 to 35 mt per hectare per year. Yields are currently at 5 mt of vegetable oil per hectare, which is ten times the yield of vegetable oil produced from soybeans. All harvesting is manual.

The ADM project that the FAS team visited has partnered with small and medium size farmers and has done interesting and commendable work in implementing social initiatives to meet the needs of the many impoverished farmers that participate in the project. 20-30 percent of the production comes from the 400 smallholder, family producers, with average farm sizes of 7.5 ha. Medium size farmers produce the remainder of the palm oil. The project works with small holders that qualify to apply for federal funding through the National Program for Strengthening Family Agriculture Palm Oil Program (Pronaf Eco Dendê) program. In this project alone, 260 families qualified for financing valued at R$16.5 million (~US$7.5 million) from the Bank of Amazonia. There is a loan limit available of R$8,000 (~US$3,800) per ha for up to 10 ha. The loan term is 14 years, with 2 percent interest, and a grace period until the seventh year, because of the long-term production cycle of palm oil. Land titling is the largest barrier to increasing production. Farmers are hesitant to plant perennial plants with such uncertainty from lack of land titling and are also unable to receive financing without land titles. ADM is currently the fourth largest palm oil producer in Brazil. AgroPalma is the largest producer, followed by Biopalma (part of Vale and poised to become Brazil's largest producer), Petrobras Biofuels (*Petrobras Biocombustivel*) is the third largest producer.

An Oil Palm

The Nature Conservancy and the Rural Environmental Register (CAR)

The Agricultural Attaché met with The Nature Conservancy (TNC) to discuss the Rural Environmental Register (CAR) and its implementation. CAR is a database of geo-references. Through the CAR system, landowners and agricultural producers can create registries on their land and how they are using it. Based on these land use registries, TNC is able to overlay production areas on state maps to gauge deforestation rates and overall land use, and focus on priority biodiversity conservation. CAR was created to function as a tool for policymakers, to help in the implementation of Brazil's Forest Code and to set benchmarks.

CAR data are housed within the state Secretariat of Environment (SEMA) and can be used to determine the composition of a property (i.e., percentage of land dedicated to farming, percentage that is part of the legal reserve, that that which is idle.) Government officials can use CAR data to formulate better focused and sound public policy regarding agricultural development. Growers underline that the CAR system has earned the trust of the local growers themselves, the state governmental authorities, and environmental groups and has enabled federal regulators to more accurately focus their efforts to detect and arrest deforestation. Satellite imagery and monitoring to track deforestation go hand-in-glove with the CAR system. According to the TNC, every sixteen days there is a new satellite image of the region which is scrutinized by government regulators. Traders take pains to source only product which is grown by farmers who are registered in the CAR, reinforcing further the CAR system.

Conclusion

In the port visits the FAS Team was able to identify the infrastructure advances made, particularly in São Luis and Belem. Nevertheless, administrative red tape and the pace of construction persist as challenges. In the short and medium term, the Team believes that the ports of the North and Northeast will continue to increase export capacity by 3-5 mmt per year. In the long term, the region is poised to radically shift the country's current agricultural export channels and thereby significantly increase Brazil's agricultural export competitiveness.

Related Reports

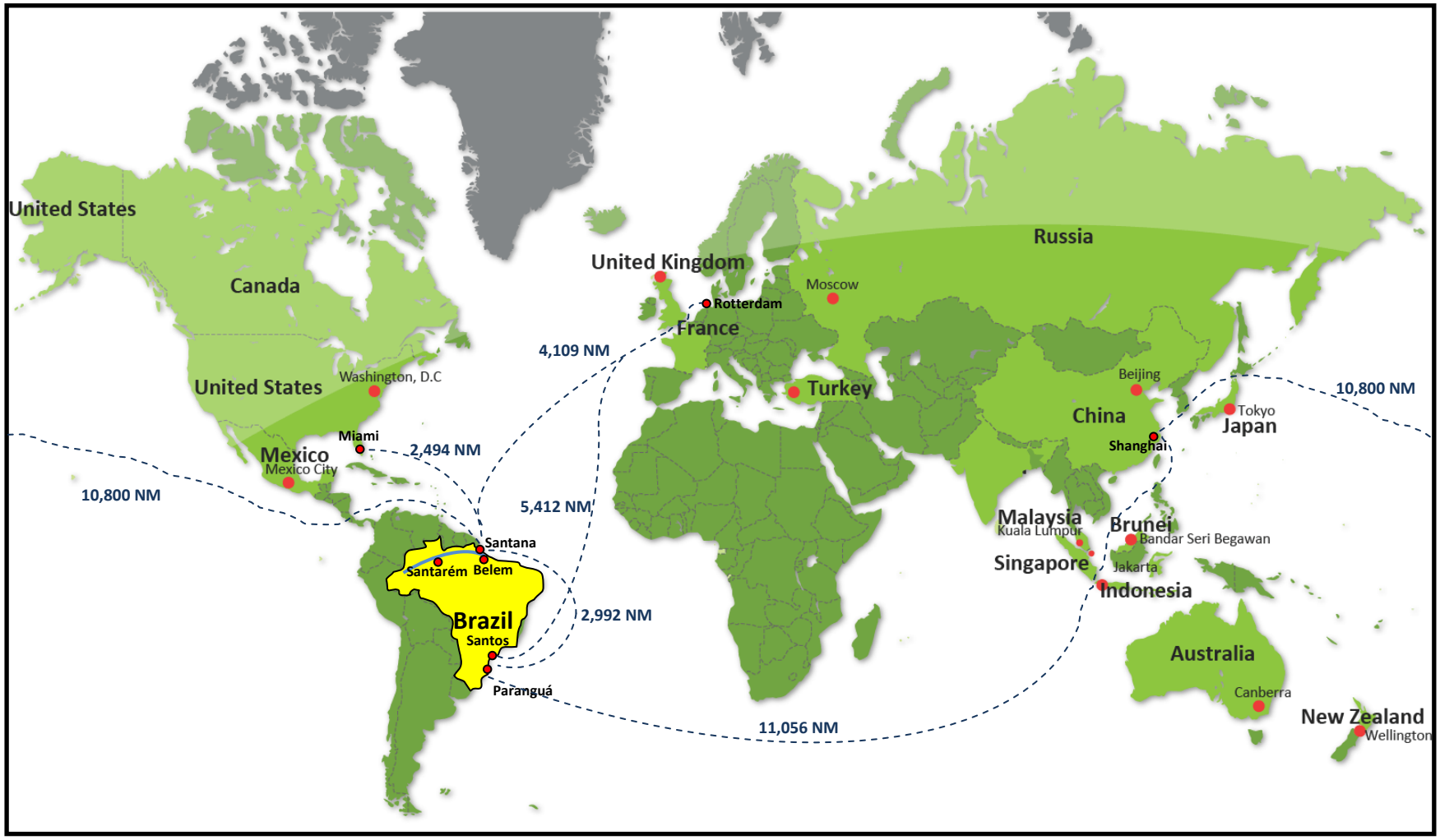
Developments in Brazil's Northern Ports Move Forward with Favorable Long-Term Implications for Brazilian Agricultural Competitiveness (July, 2012)

Appendix I: Map of the Ports of Northern Brazil. The FAS Team Visited the Circled Ports.

Source: SECEX and FAS

Appendix II: Map of the North and Northeastern Regions of Brazil

Appendix III: Routes to Principal International Markets from Brazil (in nautical miles)



Source: FAS analysis of data from NETPAS