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## ARCO NORTE AS A VIABLE ALTERNATIVE FOR GRAIN DISTRIBUTION IN THE MIDWEST: INVESTMENTS AND INFRASTRUCTURE

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*Guilherme Silveira Simões*

Centro Universitário São Lucas – PVH AFYA  
Porto Velho – RO  
[lattes.cnpq.br/6114503626512529](http://lattes.cnpq.br/6114503626512529)

*Érica Cristina Dos Santos Bueno*

Centro Universitário São Lucas – PVH AFYA  
Porto Velho – RO  
[lattes.cnpq.br/5780813433028794](http://lattes.cnpq.br/5780813433028794)

*Andressa Rosário Pimentel Soares*

Centro Universitário São Lucas – PVH AFYA  
Porto Velho – RO  
[lattes.cnpq.br/5073374664000180](http://lattes.cnpq.br/5073374664000180)

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**Abstract:** Arco Norte is a logistics system that involves ports, highways and railroads in the Amazon region. It has stimulated agricultural growth in the main producing region of Brazil (Midwest) due to the reduction in logistical costs. The Arco Norte corridor passes through several ports, with its strongest point in Santarém due to its connection with the BR-163/PA highway. The use of this system has increased from 8% to 20% in the last five years, making it a viable alternative for distributing products in the Midwest region. The development of the Arco Norte plan aims to increase the competitiveness of Brazilian soybeans in the international market. For this, it is necessary to adapt the infrastructure for the efficient and sustainable transport of goods. Key factors include the completion of the BR-163/PA, improvements in the efficiency of the BR-364/RO and the restoration of the BR-155/PA and BR-158/PA highways, the construction of Ferrogrão and the development of waterways. The BR-163 highway is the main focus of this plan, and its improvement could benefit the transport of goods to other ports in the system at lower costs. The study used data from the ANTAQ agency from 2018 to 2022 and focused on the long-distance transport of soybeans. The research highlights the importance of investment in infrastructure for the economic development of the region.

**Keywords:** Arco Norte, logistics system, multimodal, infrastructure, soy.

## Introduction

Arco Norte is a large logistics system that involves ports, highways and railroads in the Amazon region. Through this system, in recent years, it has stimulated agricultural growth in the main producing region (Midwest) due to the reduction in logistic costs. The Arco Norte corridor passes through ports in Porto Velho (Rondônia), Manaus (Amazonas), Miritituba

(Pará), Santarém (Pará), Barcarena (Pará), São Luís (Maranhão) and Salvador (Bahia).

Arco Norte has been the main alternative for the flow of national products where its strongest point is in Santarém, as it has the meeting of the Amazon River with the Tapajós River, in addition to the BR-163/PA connecting with the city. Five years ago, outflow through the Arco Norte ports was only 8% and currently reaches 20% (Vale, Monai 2016). That is, in just 5 years there was a growth of 12% using the Arco Norte system. The state of Mato Grosso is the largest producer of soy in Brazil, followed by the states of Paraná, Rio Grande do Sul and Goiás, according to a survey by CONAB in the year 2022. With the overcrowding of ports in the south and southeast due to exports and imports of other products, it becomes feasible to use the north arch corridor to transport production from the Midwest region, as it is closer to ports in Europe, Asia and the United States.

In order to favor the competition of soybeans in Brazil in relation to the international market, the planning of the northern arch was developed, in which it was proposed by the Center for Strategic Studies and Debates (CEDE) in the Chamber of Deputies in 2016. Through it, CEDE Deputies provide their peers and the Brazilian population with assistance in understanding and overcoming the impasses of national logistics. (Vale, Monai 2016) good sustainable planning. Consequently, it is necessary to adapt an infrastructure with essential efficiency for these grains to be disposed of. We must take into account that the lack of infrastructure compatible with the high demand increases the cost of cargo transportation.

For greater efficiency in the logistical route of these grains, it is imperative to complete the BR-163/PA, acclimatize the efficiency of the BR-364/RO and restore the BR-155/PA

and BR-158/PA highways. It is also extremely important to facilitate the arrival of the North-South Railway, as well as the construction of the EF-170 railway, Ferrogrão. Also enable the dredging, signaling and buoying of the Tapajós and Madeira rivers, as well as the survey of the private terminals in Vila do Conde and Miritituba. Arco Norte lacks infrastructure and investments in transport, especially waterway, rail and road. An example of this is the port of Miritituba, 230 km from Santarém, which has drawn the attention of producers as well as traders to establish terminals to receive cargo via the BR-163 and take it to the ports of the Belém system, reducing the route, which represents an economy in the cost of freight.

The main route that will directly influence the Arco Norte market is the BR-163, benefiting the flow of solid bulk through the other ports of the system, and its distribution possibilities at a lower cost. Such perspectives make clear the inclination that applications in these regions generate economic development. With this, it is possible to conclude that there is a greater and economic viability of the flow of grains generated in the Center-West of Brazil through the ports of Arco Norte.

## METHODOLOGY

The research was carried out using data provided by the National Agency for Waterway Transport (ANTAQ), from 2018 to 2022, available through the ANTAQ Panel, collected by the port authorities of the Private Port Terminals and Organized Ports, through the forms of the Port Performance System (SDP). The data selected by its cargo (Soybean) and the type of transport, Long Haul. Linear correlations were made between the North, Northeast, South, and Southeast regions, with the Midwest being excluded because it does not have long-haul ports.

## RESULTS AND DISCUSSION

The data obtained are designated in Table 1 and graphically in figure 1.

Year	North	Southeast	South	North East
2018	11267254	24514265	35511229	12373493
2019	11375644	21077742	28854826	11727695
2020	13703876	25309453	29795358	12047000
2021	13976669	27698278	31450612	13205417
2022	14587156	29266199	18591779	15614776

Table 1 Soybean exports, in tons, by macroregion, from 2018 to 2022

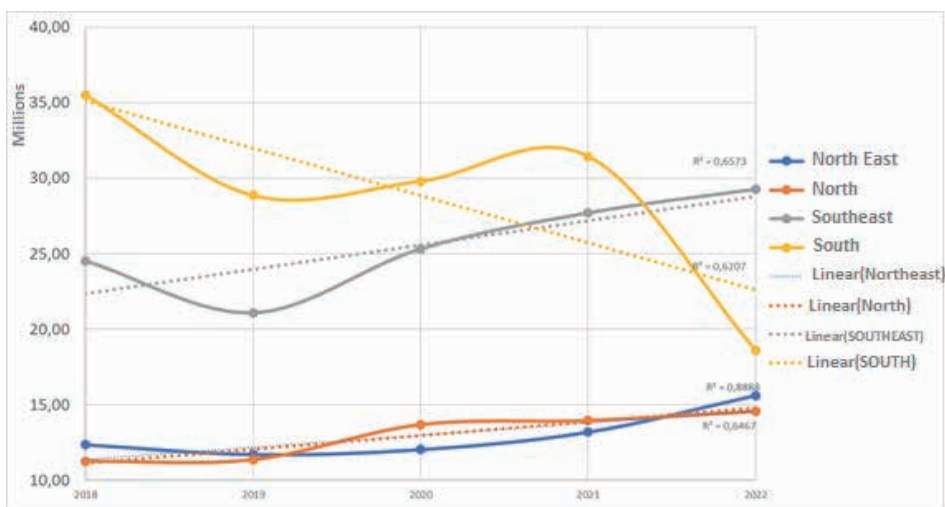


Figure 1 - Soy exports in millions of tons per time, with their respective linear regressions

The data shows a decrease in production in 2019, which resumed in the other years in all regions, with the exception of the South region, where there was a decrease in 2022. This drastic decrease in the use of ports in the South region in 2022 has relationship with the great drought in the constituent states of the region, which also had a change in the export profile of grains, such as Corn and Wheat (FAZENDA, 2022). This change in regional dynamics also stimulates competition from other ports, and the search for more interesting modal accesses, such as the railway axis, currently under analysis by the Legislature.

The correlation of the linear regressions of each of the regions is indicated in Table 2, which reinforces the trend of leaving the destination of soybean shipments from the ports of the South in relation to all other regions.

Interaction	Correlation
North-Southeast	0,866322
North-south	-0,63357
Southeast-South	-0,50314
Northeast-North	0,704093
Northeast-South	-0,79913
Northeast Southeast	0,849665

Table 2 - Linear correlation between Brazilian soybean exports in the period 2018-2022 by region

The modernization of ports in the North and Northeast show progressive growth in soybean exports, a trend that is also efficient from an energy and environmental point of view, as long as multimodality is adopted, such as internal and rail navigation (JOÃO, 2016), a trend that can be completed with Ferrogão, a project pending in the Chamber of Deputies, linking the Midwest to northern ports (CRECCA, 2019). With the creation of Ferrogão, cargo transport becomes more accessible, boosting exports. However,

analyzing the port sector in recent years, it is noted that with its modernization there has been a high level of growth in some ports, such as those in the north and northeast regions, both have become more competitive with the export of soy, pointing to advantages for these regions as economic growth in trade and increased productivity.

It is also observed that the southern region has plummeted a lot in recent years in relation to the low level of soybean exports. This results in directing these exports to other regions, such as the northeast and north. The export process is extremely variable and port companies must regularly seek the best balance between costs and the level of logistical service, with a view that generates an offer of economic growth.

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