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CHINA local/global

What Railway Deals Taught Chinese and Brazilians in the Amazon

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China Local/Global

China has become a global power, but there is too little debate about *how* this has happened and what it means. Many argue that China exports its developmental model and imposes it on other countries. But Chinese players also extend their influence by working through local actors and institutions while adapting and assimilating local and traditional forms, norms, and practices.

With a generous multiyear grant from the Ford Foundation, Carnegie has launched an innovative body of research on Chinese engagement strategies in seven regions of the world—Africa, Central Asia, Latin America, the Middle East and North Africa, the Pacific, South Asia, and Southeast Asia. Through a mix of research and strategic convening, this project explores these complex dynamics, including the ways Chinese firms are adapting to local labor laws in Latin America, Chinese banks and funds are exploring traditional Islamic financial and credit products in Southeast Asia and the Middle East, and Chinese actors are helping local workers upgrade their skills in Central Asia. These adaptive Chinese strategies that accommodate and work within local realities are mostly ignored by Western policymakers in particular.

Ultimately, the project aims to significantly broaden understanding and debate about China's role in the world and to generate innovative policy ideas. These could enable local players to better channel Chinese energies to support their societies and economies; provide lessons for Western engagement around the world, especially in developing countries; help China's own policy community learn from the diversity of Chinese experience; and potentially reduce frictions.

Evan A. Feigenbaum
Vice President for Studies, Carnegie Endowment for International Peace

Summary

Over the past decade, Chinese investments in Brazil have expanded and diversified considerably, especially ones involving infrastructure. Chinese investors have also diversified geographically. Increasingly, major Brazilian infrastructure projects are being planned or implemented with Chinese backing in environmentally sensitive regions such as the Amazon rain forest and the Cerrado, a large savanna region in Central-West Brazil.

Chinese actors have become directly involved in such projects against a backdrop of sharpening debates about sustainability and other consequences of large-scale infrastructure projects. This is especially true in protected areas such as land populated by Indigenous groups and conservation units. A notable example is the Ferrogrão project, a major railway line designed to cross sections of the Amazon and Cerrado to deliver goods to Brazilian ports.

This paper examines the diverse ways that Brazilian and Chinese actors have learned from each other as they negotiate the terms of these deals. It also explores how these learning processes have been conditioned by intense domestic political debates over these projects in Brazil. Official documents and secondary sources reveal that, rather than a set Chinese way of doing business or a stock Brazilian response, such projects entail dynamic institutional learning. Such learning is shaped not only by the particulars of the Ferrogrão project but also by Chinese actors' broader engagement with Brazilian infrastructure projects over the past ten years.

Introduction

As China's interests and presence in Latin America and the Caribbean (LAC) have expanded, Chinese firms have been changing their strategy in Brazil. Specifically, they have been diversifying away from mostly buying financial assets to also incorporating more greenfield investments, which allow China-headquartered companies to develop local operations using Brazil-based subsidiaries. Transportation is a key sector for such investments due to vast demand in Brazil, the accumulated experience of Chinese firms on transportation projects elsewhere in LAC and throughout Asia and Africa, and the Chinese government's economic and strategic interests in this sector. As these transportation projects are planned and implemented, both Brazilian and Chinese actors are working to learn, adapt, and negotiate the parameters, norms, and practices of these deals.

The expansion and diversification of Chinese infrastructure investments in Brazil are intensifying debates about the socio-environmental risks of large-scale projects, including those that affect environmentally sensitive biomes, such as the Amazon basin and the Cerrado, a large savanna in Central-West Brazil. Chinese actors have encountered multitudes of Brazilian actors and complex regulations that are more difficult to decipher and navigate than in many other developing countries. That is because Brazil's regulatory frameworks are generally more robust and less flexible than those in African and other LAC countries and because the country's bureaucracy is extremely complicated. Moreover, much of Brazil has strong, if embattled, civil society organizations that have vigorously opposed the environmental and climate policies of far-right President Jair Bolsonaro. Meanwhile, some Brazilian municipal and state governments, many of which have leaders that are at odds with the Bolsonaro-led federal government, have sought greater autonomy in decisionmaking, even if, by law, agreements on such deals must be signed at the federal level.

Many aspects of Chinese investments in Brazil are best understood through the prism of institutional learning. This entails actors from various places mutually adapting by seeking and incorporating new knowledge in complex, highly dynamic ways. Even as Brazilian and Chinese actors have engaged in negotiations and have become better acquainted with each other's norms and practices, they also have come under pressure from societal and political actors in Brazil and abroad, especially given sharpening debates around climate change and sustainable development.

This paper explores two key questions. First, how has institutional learning about the mitigation and management of socio-environmental risks been unfolding around Chinese investments in transportation infrastructure in Brazil? Second, what specific types of adaptations have emerged on both the Brazilian and Chinese sides?

This paper focuses on the Ferrogrão railroad project (also known as the EF-170 Railway), which is designed to run from a Brazilian agribusiness powerhouse (the state of Mato Grosso) to the northern state of Pará. This project will affect both the Cerrado and the Amazon, areas inhabited by Indigenous peoples, *quilombolas* (Afro-Brazilian descendants of escaped slaves), and other traditional communities, as well as areas inhabited by small-scale farmers.

Although the project is still being negotiated, it has already been the subject of much controversy in Brazil. Economically, the Ferrogrão project is being questioned on account of its costs. Politically, Ferrogrão is set to be built in a charged environment marked by sharpening debates over sustainable development and strong lobbying from interest groups representing numerous parties from agribusinesses to truck drivers. From a sustainability and climate standpoint, the project is being planned even as pressure increases on infrastructure companies operating in Brazil to implement suitable environment, social, and governance principles and to adopt more sustainable practices.

The authors draw on a combination of desk research, official documents, and interviews with key stakeholders to understand the evolution of the project and the behavior of key stakeholders. This research seeks to identify key forms of institutional learning by Brazilian and Chinese actors involved in the Ferrogrão project, as well as the main tensions over potential socio-environmental issues, such as forced displacement, imbalanced development, and illegal deforestation.

The paper's first section provides an overview of recent research on sustainability and infrastructure, focusing on overseas Chinese investments. It also explains the framework used in this analysis and defines key concepts, especially those of institutional learning and mutual adaptation. Next, the paper analyzes Chinese investments in Brazilian transportation infrastructure projects, with a focus on the storage and transportation of Brazil's main exports to China. Third, the paper describes the ongoing negotiations, plans, and controversies associated with the Ferrogrão project, identifying key areas of institutional learning by Brazilian and Chinese actors so far. The final section summarizes major takeaways and offers recommendations for key stakeholders.

China's Track Record on Infrastructure Investment

Infrastructure has once again moved to center stage in international development, and China's approach to development abroad is a major factor driving this trend.

Infrastructure Makes a Comeback

The main precedents for contemporary, infrastructure-led development date back to the years after World War II, when the World Bank provided substantial investment for such projects. Experts viewed infrastructure as an essential way to structurally transform the productive capacity of a country or region. Yet a variety of factors, including growing indebtedness among developing countries starting in the 1970s and a wave of fiscal conservatism in the 1980s, led to a shift away from this focus on infrastructure.[1] Other driving factors were an increasing awareness of corruption associated with large-scale infrastructure projects and growing concerns about the socio-environmental impacts of massive hydroelectric dams, roads, and railways.

As a result, other elements of international development such as education and healthcare gained prominence throughout the 1980s. But starting in the 1990s, the rapid expansion of the Chinese economy, which experienced almost three decades of nearly double-digit annual growth in gross domestic product (GDP), led to new interest and demand for infrastructure investment.[2] Even as China invested heavily in domestic infrastructure, with Chinese state-run and private companies acquiring considerable experience and technology in the sector, Chinese leaders also looked to investments abroad as a way to maintain the pace of the country's economic growth, or at least prevent a rapid deceleration.[3] Chinese leaders encouraged Chinese companies to seek out new opportunities abroad, and a massive wave of infrastructure construction projects became a lynchpin of Chinese development strategies overseas.

Especially since the 2000s, three key factors have propelled infrastructure investment back to the forefront of international development. First, offers of relatively cheap Chinese capital either created new demand for large-scale infrastructure projects or awakened latent demand. Second, China helped to lead the creation of new institutions, such as the New Development Bank—a multilateral bank established by Brazil, Russia, India, China, and South Africa—and the Asian Infrastructure Investment Bank, both of which put infrastructure at the heart of their missions.[4] Third, in response to this growing competition from emerging institutions, the World Bank and other established organizations began once again to expand their infrastructure investment portfolios.

By the 2010s, China boasted a vast, sprawling, and modern domestic railroad system, whose freight system is monopolized by a major state-owned enterprise (SOE) called the China State Railway Group Company. This system features not only massive transportation projects, such as the Qinghai-Tibet Railway and the Hong Kong–Zhuhai–Macau Bridge but also a Chinese-developed high-speed train that is the longest such railway network in the world.[5] Much of this domestic Chinese infrastructure has been built through dedicated financing streams by Chinese state-backed policy banks, such as the China Development Bank. The ensuing leaps in transportation infrastructure led some experts to argue that the development gap between China and other emerging economies such as Brazil, Argentina, and India can be attributed to China's early focus on ambitious infrastructure projects. Indeed, while China invested around 9 percent of its GDP in infrastructure in the 1990s and 2000s, most emerging economies invested only between 2 and 5 percent of their GDP.[6]

Abroad, China vastly expanded its investments in transportation infrastructure, primarily in Africa, often offering loans in exchange for resources. Such projects attracted attention not just for the economic growth they often helped to spark but also for the considerable socioeconomic inequalities they engendered and, in many cases, Chinese labor and human rights practices that were at odds with international norms.

Yet the practices of Chinese companies have changed over time. These outcomes have depended, to a great extent, as elsewhere, on local context. For instance, research by scholar Maria Adele Carrai shows that, while Chinese SOEs investing in infrastructure in East Africa have adopted corporate social responsibility principles in response to pressure from both the Chinese central government and host country governments, the resulting outcomes have varied.[7] This variability is found in great part because China's stated approach is "above all adaptive and conforms with its core principles of sovereignty and non-interference."[8]

These dynamics became even sharper as China developed a vision for its Belt and Road Initiative (BRI). With the claimed objective of improving regional and global connectivity, the BRI has entailed massive investments in domestic and cross-border transportation infrastructure throughout Eurasia and even further afield.

The unprecedented pace and scale of Chinese actors' infrastructure construction spree through the BRI has stimulated concerns because of the history of large-scale transportation projects around the globe that have had significant negative environmental impacts.[9] Many commentators have expressed

concerns that China neglects to follow recognized best practices for sustainable development. The behavior of Chinese companies in Brazil is increasingly subject to such scrutiny even though the country has not joined the BRI, unlike several other LAC countries such as Bolivia, Chile, Costa Rica, Cuba, Ecuador, El Salvador, Guyana, Panama, Peru, Suriname, Trinidad and Tobago, Uruguay, and Venezuela.[10] Brasilia has opted not to officially join the BRI in part due to an ambiguous foreign policy toward China and an attempt to develop a closer alignment with the United States in recent years.[11] Due to Brazil's political and economic weight in the region, Beijing continues to lobby the country to sign on.[12]

Institutional learning is a useful lens for analyzing the changing and varied dynamics of the negotiations and implementation of Chinese infrastructure projects. Rather than take for granted that actors arrive at negotiations with inflexible, pre-set notions of how to proceed, institutional learning involves looking at how organizations explore new dynamics and incorporate and adapt new information and practices, adjusting somewhat to the expectations and norms of their counterparts.[13] This has been the case among both the Brazilian and Chinese actors involved in the Ferrogrão project.

Chinese Transportation Investments in Latin America and the Caribbean

While the main pillar of China's relationships with LAC countries has been trade, especially centered on exchanges of LAC raw materials for Chinese manufactured goods, Chinese investment has expanded rapidly across the region. Between 2005 and 2015, Chinese development banks invested on average $1.7 billion per year in LAC.[14] In January 2015, Chinese President Xi Jinping established ambitious goals for commercial exchanges with LAC: $500 billion in trade and $250 billion in direct investment between 2015 and 2019.[15] In practice, China-LAC trade reached $316 billion in 2019 and dropped slightly to $315 billion in 2020 amid a decline in world trade due to the coronavirus pandemic. In terms of investment, between 2005 and 2020, China poured $136 billion into LAC, including $61 billion in Brazil.[16]

This expansion in economic ties is also reflected in key policy papers as part of China's regional strategy for LAC, which heavily emphasize improving infrastructure for the exporting of commodities. For instance, in China's 2016 "Policy Paper on Latin America and the Caribbean," the first types of investments mentioned are "transportation, trade logistics, [and] storage facilities."[17] This focus reflects the strategic dimensions of Chinese investment in Brazil, which is meant to help guarantee cheaper and more reliable supplies of raw materials for industrial uses and consumption.

Chinese investments in LAC have been diversified from mostly financial acquisitions (through mergers) to greenfield endeavors as well, including many undertaken via public-private partnerships (PPPs). At the political level, infrastructure investments have come to occupy a more prominent position in China's strategic relations with LAC countries. For instance, Chinese investments in hydroelectric dams served as a gateway for financing for a broader range of infrastructure projects in Argentina, including in the energy and transportation sectors.[18]

China's growing interest in infrastructure in LAC is also explained by the region's massive infrastructure deficit. This includes both gaps in infrastructure and also existing assets that are deemed inadequate or that do not work properly. Both kinds of infrastructure shortfalls tend to stymie economic growth and to reproduce and reinforce the region's sharp structural imbalances. Moreover, the gap contributes to the region's lack of economic diversification and results in high logistics costs, inadequate connectivity, and highly unequal access to services. LAC's infrastructure gap tends to reinforce income and wealth disparities, in addition to the high vulnerability of the region's populations to the effects of climate change.[19]

Chinese SOEs dominate transportation investment in LAC.[20] Like in many parts of Africa, Chinese actors' involvement in such projects in LAC varies based on the existing constraints of host countries. Katherine Bersch and Riitta-Ilona Koivumaeki found that in countries with strong governing institutions—such as an independent judiciary, an effective ministry of transportation, and strong national development banks—Chinese companies play a role similar to that of other foreign entities involved in infrastructure development. However, in countries with fragile governing institutions and weak infrastructure capacity, China tends to be more dominant in the negotiations, design, and implementation of such infrastructure projects.[21]

Chinese investment in transportation infrastructure in LAC has significantly expanded over the past two decades. In the past nearly twenty years, China has gotten involved in about 150 infrastructure projects in the region in one form or another.[22] Based on data from 2018, the latest year with available data, ground was broken on around half of these projects to some degree.[23] A handful of projects have been scrapped or postponed, but the majority are undergoing technical and financial feasibility assessments or are awaiting decisions on which developers will run point. Major Chinese companies in the infrastructure sector, such as the China Harbour Engineering Company and China Railway

Construction Corporation, have invested in major transportation infrastructure projects throughout LAC, including a high-speed train from Mexico City to Querétaro in central Mexico and a twelve-kilometer-long bridge linking the capital city of Salvador to the island of Itaparica in north-eastern Brazil.[24] But some major projects, like the proposed Bioceanic Railway, which would link the Brazilian port of Santos on the coast of the Atlantic Ocean with the Chilean ports of Iquique and Antofagasta on the coast of the Pacific Ocean, still exist only on paper.

Even at the planning stages, these investments have generated controversies over their social and environmental impacts.[25]

The Amazon Rain Forest

Beginning in the early 1980s, several countries along the Amazon basin began enacting legislation to enhance environmental integrity, especially in the region's forested areas, and to protect the rights of Indigenous groups and other communities affected by new development projects. Brazil did so in 1981 when its legislature created the National Environmental Policy by passing Environmental Policy Act No. 6.938.

Since taking office in 2019, however, Bolsonaro has promoted the rapid dismantling of federal institutions tasked with protecting the environment and the rights of Indigenous groups and other traditional peoples. Budgets have been slashed, specialized staff have been fired, and technical teams have been replaced by military officers with no specialized training. Government policies and official messaging have also fomented the predatory use of natural resources and development through massive infrastructure projects, tendencies that again reflect the dominant view of development in the Amazon that prevailed during Brazil's years under dictatorship (1964–1985).

These decisions have had a massive impact, especially on the Amazon and the Cerrado. There have been new peaks in the frequency of forest fires, illegal deforestation, and land encroachment for farming, ranching, and illegal logging, while illegal mining also has skyrocketed, especially on Indigenous lands and conservation units.[26] The region's inadequate state presence and high poverty rates have been further exacerbated by the coronavirus pandemic, which has hit the region hard, with unusually high rates of mortality.[27] As a result, Brazilian civil society has mobilized to resist or even reverse these policies, often in alignment with external actors including donor states and consumer groups. More than ever, these ecological areas—especially the Amazon—have witnessed disputes over land use and development policies.[28]

Although these Chinese forays into the Brazilian Amazon are still incipient compared to incursions elsewhere in Brazil and in other Amazon states like Bolivia and Ecuador, this new wave of investments is occurring in a political context that has changed markedly in the past decade.[29] Consequently, institutional learning is taking place within a highly charged political environment both nationally and regionally.

Institutional Learning on Brazilian Infrastructure Projects

Between 2005 and 2019, China's investments in Brazil were concentrated in the energy (72 percent) and mining sectors (7.4 percent). Transportation projects received 6 percent of the total investment in the amount of $4 billion.[30] China's infrastructure investments often have dealt with political and economic dilemmas that exemplify Brazil's troubles in recent decades.

Chinese Investments in Brazilian Infrastructure

As in much of LAC, the lack of investment in infrastructure has been one of the biggest bottlenecks of economic growth in Brazil. Since the late 1970s, when the national developmentalist model entered a period of crisis, the country has suffered from low investment in energy and transportation. For more than forty years, Brazilian governments have been investing less than 3 percent of GDP in infrastructure.[31] Specialists consider that amount well below what is required even for the maintenance of existing assets.

Railways are one of the most neglected aspects of Brazil's infrastructure. This is, in part, a consequence of state policies that have heavily favored road transportation. Since the 1980s, the country has invested only 0.15 percent of its GDP each year in railways. As a result, in 2018, Brazil had just 30,000 kilometers of railway lines, in comparison to 202,000 kilometers in the United States and 146,000 kilometers in China.[32] Only 15 percent of Brazilian cargo is transported via railways, while in countries like China and the United States, the percentage is triple that figure.[33] Most of the cargo transported in Brazil is iron ore because the giant mining company Vale has had a decades-long interest in building such infrastructure to connect its mines and ports.[34]

With the economic recession and political crises of the 2010s, successive Brazilian governments came under growing pressure from several important economic actors, including agribusiness companies, to address these logistical gaps. In response, the government sought to attract private investment—both domestic and foreign—to expand the country's infrastructure through PPPs and state concessions granted through public auctions.

The most important such government initiative is the Investment Partnerships Program (Programa de Parceria em Investimentos—PPI), which was created in 2016. In the railway sector, the PPI aims to attract 29 billion Brazilian reais (about $5.5 billion in U.S. dollars) by late 2024 in concessions meant to expand Brazil's railroads by 2,800 kilometers, although the initiative has no fixed deadline.[35] As of 2021, discussions are underway on six projects, and four others have already been completed.[36]

With the global commodities boom of the 2000s, Asian countries—especially China—became the biggest foreign market for Brazilian agribusiness.[37] Given Brazil's enormous territorial size, the logistics costs of transporting such goods are huge, and exporters depend on highways to ship most of their cargo to the ports. There are also political risks. In 2018, truck drivers shut down the economy for an entire week with a strike aimed at securing better pay and benefits.[38] They achieved some of their goals and have remained an important pressure group since then.

For Chinese actors, investment in Brazil's transportation infrastructure is linked to concerns about the export of commodities to Asia. Building railways, warehouses, and ports would make it cheaper and quicker to move soybeans and iron ore from Brazilian farms and mines to the ships needed to transport them to the other side of the world. Chinese companies enjoy important advantages in this kind of business:

> From China's perspective, investments in infrastructure, beyond the return for the investors, are attractive because they will ensure a more efficient flow of the main export products (soybeans and minerals) to the Asian giant. . . . Chinese companies have great capacity to take part in auctions and to win them, because they have access to financing and a huge expertise in infrastructure.[39]

One example is found in Pará, a state in the Brazilian Amazon that is rich in natural resources. It is one of the country's main agricultural frontiers, where soy cultivation has been expanding rapidly. This state is also a hotspot of environmental crimes such as land encroachment, illegal deforestation, man-made forest fires, and illegal logging and mining. Pará is thus a place of rampant social and environmental conflict, especially due to the impact of these initiatives (legal and criminal) on Indigenous peoples, riverside communities, and other traditional populations.

Another example is the Pará Railway, a joint venture between the state-owned China Communications Construction Company (CCCC) and Vale. During its initial phase, the railway is expected to connect the city of Marabá to the port of Barcarena, a distance of about 500 kilometers (or about 310 miles). Construction is set to begin in 2021 with a budget of 7 billion reais ($1.3 billion);[40] once completed, the railway will be used to ship iron ore from the Carajás complex, the largest iron ore

mine in the world. During a second phase, the railway will be extended southward to the city of Santana do Araguaia to incorporate the exporting of meat and grains.[41]

Despite these grand plans, in many cases, Chinese investments in LAC railways have been announced but never implemented due to social and environmental concerns or technical problems, which at times have led to their cancelation. One example is a separate ambitious bullet train project aimed at linking the Atlantic and Pacific Oceans through Brazil, Peru, and Venezuela.[42]

In 2016, a 12-billion-reais (or $2.2-billion) plan to build the West-East Integration Railway (Ferrovia de Integração Oeste-Leste) stalled. Plans for the 1,500-kilometer route were designed to connect the northeastern state of Bahia to the state of Tocantins in Central-West Brazil, where it would link with the North-South Railway. The project reached an impasse when the Chinese government proposed to Brazil that the two countries create a binational state-owned company. Brazil's then minister of transportation Mauricio Quintella disliked the idea of a joint venture between the China Railway Construction Corporation and the Brazilian state company Valec. As Quintella explained:

> There would be no auction nor competition, it would not allow us to [engage in] dialogue with other players in order to get the best proposal. . . . Of course we need investments. But the other possibility is a normal, pure concession. I can't say that we prefer this, but Brazil has established rules.[43]

The minister also pointed out that, in addition to requiring a change in Brazilian law, the model China proposed would encourage other international actors to demand similar terms. After all, he noted, "The Russians, who are interested in the North-South Railway, could want the same."[44]

Chinese companies have learned several lessons when investing in LAC railways, acquiring a more in-depth understanding of the region's legal and political realities and then adapting accordingly. Chinese railway companies are learning to operate in LAC by dealing with local socio-environmental rules, complex litigation, and public auctions for concessions, which became the preferred way for the Brazilian government to attract investment for its infrastructure projects. These gradual adaptations are the result of a decade-long learning curve, which is especially important in Brazil for the expansion of the country's two major transportation bottlenecks: highways and railways.[45]

Due to its timing and geographical location, which have direct implications for a broad swath of the Amazon and Cerrado regions, Brazil's Ferrogrão project is an ideal case for studying these processes of Chinese adaptation to local realities and constraints.

The Ferrogrão Railway Project

The Ferrogrão project aims to link the state of Mato Grosso in Brazil's Central-West region to Pará in the eastern part of the Amazon along a 933-kilometer route (see map 1). If the project is given the go-ahead by Brazilian courts, it is set to begin operating in 2030. According to the plans, at first the tracks will connect the city of Sinop in Mato Grosso to the river port of Miritituba on the Tapajós River in Pará, but other connections are also foreseen.[46] The main goal is to transport grain via the Northern Arc—ports in north and northeastern Brazil—whereas nowadays such shipments travel via the north-south highway known as BR-163, one of the main roads in Brazil's interior. The corridor to be consolidated by Ferrogrão and the highway will constitute a new route for exporting soy, corn, fertilizer, sugar, ethanol, and oil derivatives.

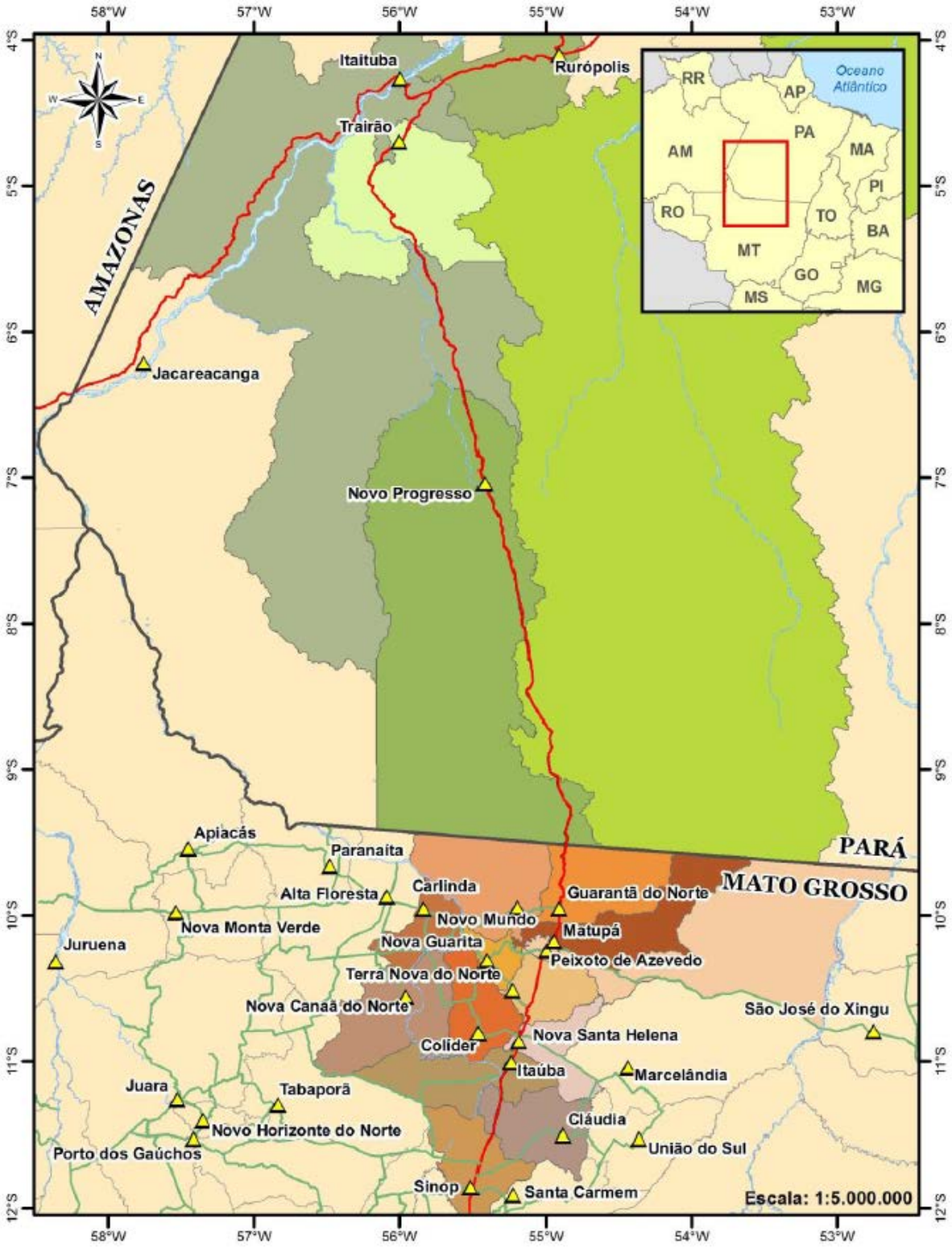
The project was first conceived of in 2012, when Brazil's government, under then president Dilma Rousseff (who held office from 2011 to 2016), proposed plans to cut the country's logistical costs, which are exceptionally high by international standards, by 30 percent.[47] The government's announcement that it intended to invest in 10,000 kilometers of railway prompted private companies to begin identifying potential areas where railway expansion would lead to an increase in agricultural production.[48]

One of the areas identified in the plans was Mato Grosso, which is an agribusiness powerhouse with an overwhelming focus on soybeans, corn, cotton, and beef.[49] The state is the largest producer of soy in Brazil, accounting for 26.9 percent (33 million tons) of the national total of 122 million tons in 2020.[50] As of 2019, it has the largest cattle herds (almost 32 million cows) in the country, or nearly 15 percent of Brazil's national production.[51] However, Mato Grosso—especially the northern part of the state—has inadequate capacity for transporting commodities to ports for export, including to China. For now, the state's wares are exported via the ports of Santos (in the state of São Paulo) and Paranaguá (in the state of Paraná), both of which are over 2,000 kilometers away from the northern parts of Mato Grosso where a large part of the region's soy and meat production is concentrated.

The Ferrogrão project has been hailed by many private sector actors as a turning point for Brazilian commodity exports. The owner of the largest soybean-producing conglomerate in Mato Grosso, the Bom Futuro Group, has stated that Ferrogrão will yield a revolution in agriculture, allowing for another economic boom in Mato Grosso along the lines of what took place in the 1970s and the 1980s, when the state implemented large-scale agriculture.[52] The private sector has also presented the railway's impact as an opportunity for development: "When Brazil has the infrastructure that it deserves and needs, we'll have strong development not only in Mato Grosso, but along the entire development track of the railroad."[53]

MAP 1

Planned Route of the Ferrogrão Railway



SOURCE: Federal Government of Brazil

Like Pará, Mato Grosso is part of what is known as the arc of deforestation, a curve along the southeastern edge of the remaining Amazon rain forest, where land is being cleared for agriculture (especially soybeans), ranching, logging, and land speculation. From 2019 to 2020, Mato Grosso had the second-highest deforestation rate in the country (after Pará), and 88 percent of this deforestation was illegal, totaling over 1,700 square kilometers of destroyed vegetation cover in that year alone.[54]

Notably, Mato Grosso is quite socioeconomically diverse. In 2020, a reported 42,538 Indigenous people belonging to forty-two ethnic groups lived in the state, most of them on Indigenous lands.[55] Out of the state's 141 municipalities, fifty-five contain Indigenous lands. Around 12 percent of Mato Grosso is composed of Indigenous lands, a figure that could go up to 18 percent if another twenty-one areas claimed by Indigenous groups are officially demarcated as Indigenous lands.[56] The state is also home to twenty-two *quilombola* communities distributed across fifteen municipalities.[57]

The state of Pará has the highest rate of deforestation in Brazil, especially due to the expansion of illegal logging, cattle ranching, and soy farming.[58] This phenomenon has fueled ongoing conflicts over land rights between the Brazilian government, Indigenous groups and other traditional communities, and ranchers. The majority of the state's population is of mixed ethnicity,[59] with Pará also being home to large Indigenous populations (the biggest Indigenous communities include the Andira Marau, Munduruku, and Kayapó) and, to a lesser extent, to *quilombola* communities. Pará is home to approximately forty Indigenous groups, mostly scattered across twenty-seven tracts of land that have been demarcated by the government's National Indian Foundation as Indigenous lands.[60]

Pará's top exports are iron ore, aluminum, soybeans, and wood, and the flow of commodities depends on the state's limited infrastructure, including its ports, the main ones being Belém, Vila do Conde, Miramar, and Santarém.[61] The Ferrogrão project and BR-163 extension may add another port area to this list. Miritituba, a district on the banks of the Tapajós River, is part of the municipality of Itaituba with approximately 100,000 inhabitants.[62] Miritituba is closer than the ports of Santos and Paranaguá to the soy producers in Mato Grosso, but so far access has been challenging due to the area's poor infrastructure, especially its dependence on a short stretch of the Trans-Amazonian Highway (BR-230) that cuts across BR-163.

Given these challenges, until recently, Miritituba was overlooked as a potential Amazon route for exports from Central-West Brazil in favor of the nearby port of Santarém.[63] While large cargo ships are unable to reach Miritituba from the Atlantic Ocean due to the shallowness of the Tapajós River

along this stretch, flat-bottomed barges can carry considerable cargo along the river. Major players in Mato Grosso's agribusiness sector and their politician supporters, such as former Mato Grosso governor Blairo Maggi, have long pushed the idea of better infrastructure connections so that commodities can be exported at greater scale via the Amazon.

As a result of the long-term economic prospects of the Ferrogrão railway, land in Miritituba has become highly sought after by private companies, including giant U.S. agribusiness companies like Bunge and Cargill as well as large logistics firms. These companies are rushing to buy plots of land in Miritituba even as they carry out environmental licensing processes for building terminals in the port area.[64]

Plans for Ferrogrão are being discussed in a part of Brazil marked by high tensions over land use. Shortly after technicians ascertained that the BR-163 road—which the government had planned to add additional lanes to—lent itself to railway construction due to long stretches of flat land, discussions began on the project's expected environmental impact. The private sector, based on initial assessments, argued that there would be advantages to building a railway instead of adding lanes to the existing road, arguing that opting for the railway instead would save an estimated 1 million tons of carbon dioxide emissions per year.[65]

One executive of a private sector firm is quite optimistic about the project's impact. He even claimed that the railway project would entail "zero deforestation" because it would cut through areas already cleared of trees for BR-163.[66] He further argued that sustainable development was possible and needed for the area, saying:

> The BR-163 area is poorly developed, and it is necessary to make Ferrogrão improve the quality of life of the people who live there, respecting their traditions and histories. In the stretch of Pará, it is necessary to implement projects that induce the sustainable development of the region, respecting its residents and traditional communities. The social issue is the biggest challenge, but it is also Ferrogrão's biggest opportunity.[67]

Yet the project also has its critics. The planned railway route is expected to have a significant social and environmental impact on forty-eight protected areas, including nineteen tracts of Indigenous lands and holdings of the Paraná and Kayapó. Relevant concerns include deforestation, increased water usage and contamination, intensified fertilizer usage, and more concentrated land ownership.[68] These concerns have been amplified because the local communities expected to be affected by the

project have not been consulted, in violation of the International Labour Organization's Indigenous and Tribal Peoples Convention (also known as Convention 169).[69] Several of these communities have expressed their alarm to the government. For instance, in November 2017, the Kayapó Mekragnoti, an Indigenous group in Pará, sent a letter to Brazil's national public prosecutor's office (the Federal Public Ministry), the National Agency for Land Transportation (Agência Nacional de Transportes Terrestres, ANTT), and the Ministry of Transport, Ports and Civil Aviation (now called the Ministry of Infrastructure). The letter argued:

> The railroad today already impacts the peoples of the region, even though it exists now only on paper. The number of amendments to decrease the protection of conservation units that deputies made in Congress shows the amount of pressure from farmers in our region. Many large landowners and mine owners here are politicians. Ferrogrão will not transport people. But it will transport soybeans, corn, sugar, diesel, gasoline, alcohol, and fertilizer. Studies say that the demand for the railroad to transport these products will almost double from 23 million tons to 40 million tons between 2020 and 2050. If the railway has already caused all these impacts before it gets off the ground, its impacts are going to be even larger once it is actually built.[70]

Preliminary environmental impact studies conducted by the ANTT appeared to acknowledge as much, saying:

> Indigenous and traditional cultures may undergo a process of disruption caused by contact with new cultural elements brought by people who will come to the region, such as construction workers and the migrant population associated with these movements.[71]

In December 2017, around ninety members of the Munduruku community blocked a building in Itaituba, Pará, where one meeting in a series of six public hearings was to be held at the request of the ANTT to gather societal input for the technical studies on the implementation of the Ferrogrão project. They stated that they would only leave when the meeting was canceled, and they called the public auction for Ferrogrão illegal due to the lack of previous consultation.[72] Ever since, several other traditional communities along the project's planned route have criticized the project and requested its suspension. In May 2021, the Federal Public Ministry issued a technical note reaffirming that, prior to any final decision on the project's fate, consultations must be carried out with Indigenous groups and traditional communities who live within the areas affected by the Ferrogrão project.[73]

Among the most sensitive areas that could be affected, the railway would cut across Jamanxim National Park, a conservation unit of almost 900,000 hectares with the highest rates of illegal deforestation among conservation units in the Amazon.[74] In addition to having the BR-163 cut across its

eastern reaches, the park is already under tremendous pressure from agricultural expansion and wood extraction. Because of the risks that Ferrogrão would greatly expand these threats to the conservation unit, in 2019, the Federal Public Ministry recommended that the ANTT modify the Ferrogrão project's route and that the agency consider preserving the entirety of the park's territory as a conservation unit despite the federal government's attempt to reduce its size to accommodate Ferrogrão.[75] The left-leaning Socialism and Liberty Party filed a lawsuit to suspend the railway project, and in April 2021, Brazil's Supreme Court issued a favorable decision.[76]

Although the legal disputes continue, the Supreme Court decision has brought nationwide attention to the sustainability risks of the Ferrogrão project.[77] In response, Bolsonaro's minister of infrastructure stated publicly that "useful innocents" were being manipulated to block the railway project and that the environmental criticisms of the Ferrogrão project were a "smokescreen" created by actors that fear the new economic competition that the project would enable.[78]

There have also been concerns that the Ferrogrão project's costs are understated. Estimates for the total cost of the project vary significantly. According to the Brazilian government's calculations, the Ferrogrão railway will cost approximately 21.5 billion reais (or around $4 billion).[79] Of this total, a projected 8.4 billion reais would be spent on the construction and 13.1 billion reais on the maintenance of the railroad, which is due to begin operating in 2030 if all goes according to plan.[80]

One economist and infrastructure specialist has argued that the project entails additional risks that could cost the state billions more than expected, or as much as an estimated total of 29 billion reais.[81] This is because the government has agreed to take several measures to reduce the project's risks for vendors. During construction, additional costs of expropriation and resettlement would be borne by Brazil's National Treasury if the costs of the project's socioenvironmental impacts, including those related to securing land rights and population resettlement, end up surpassing those specified in the contract. In addition, project construction is predicted to last seven years, after which the government would help pay part of the operational costs and interest. [82] Finally, the Brazilian government changed the Brazilian Development Bank's lending policy to make it more attractive for prospective borrowers interested in the Ferrogrão project. First, the date that borrowers must start repaying the loan has been extended from five years to between seven and eight years. Second, the period for the entire loan to be repaid has also been extended from twenty years to between twenty-five and thirty years.[83]

Since 2018, to reduce private sector skepticism over the costs and the reputational risks associated with the railway's socioenvironmental impacts, the government has taken several measures to cut the overall cost of the project, including by increasing the share of the project to be financed by the Brazilian Development Bank from 70 percent to 80 percent.[84] The government would only step in in the event of a few types of circumstances: if the costs of the project's environmental and social

impacts surpass those specified in the original deal during construction, if major post-construction "crop failures" affect the private sector's ability to cover some of the costs, or if a new railway branch being planned in Mato Grosso is finalized before 2045. The government has also been vocally defending the argument that the project is environmentally friendly, claiming that the railway would help cut carbon dioxide emissions by reducing the number of trucks that currently transport goods along the same route.[85]

The public auction to attract bidders for the project's construction has been postponed several times, as the timeline has been affected both by the coronavirus pandemic and by scrutiny from the Federal Court of Accounts (Tribunal de Contas da União), the country's audit court, which has expressed concerns over the potential impact the project could have upon Indigenous and traditional communities, including risks of displacement.[86]

Institutional Learning and Mutual Adaptation

Previous Chinese experiences investing in Brazilian infrastructure—especially in the 2000s—set important precedents for the Ferrogrão project. The biggest actors in the sector—Chinese SOEs including two central government–directed behemoths, the State Grid Corporation of China and the China Three Gorges Corporation—chose to enter the Brazilian market by buying assets from firms that were Brazil-based or based in other countries (such as Portugal and Spain) but already operated in Brazil.[87]

Through those acquisitions, these Chinese companies retained a staff of Brazilian specialists with in-depth knowledge of and familiarity with Brazil's business culture, regulatory norms, and complex legal and political system. This period marked the start of a long learning process, since at first Chinese companies had little experience in LAC and had little mutual trust with local partners. Yue Haiping, a Chinese executive who has managed joint ventures between Brazilian and Chinese firms, has reflected on what he learned after working in LAC for several years:

> It is exactly because of that incomprehension caused by the distance that the Chinese companies did not trust the Brazilians. They usually thought that they should have total control, being managed by their personnel to do things right. . . . Indeed, the level of internationalization of these [Chinese] companies is not high. In terms of skill and qualification, it is hard to meet somebody from these companies that really can be independent after he is sent to Brazil, to become familiar with the country, to understand intercultural administration. It happens that this type of integration is hard to achieve. [This is] because, after the creation of the company, many people discovered that the management team sent from China could not really control the firm. Lots of things still depended on the local staff.[88]

The main challenges for Chinese infrastructure investors, according to Yue, involve how to deal with Brazil's legal and political system. The country has a complex federal structure, which often demands that companies negotiate with mayors, governors, and national authorities to obtain permissions and pay taxes. This is especially relevant when major infrastructure projects are concerned because they often cross interstate boundaries. The chief executive officer of State Grid Brazil, a Brazilian subsidiary of the State Grid Corporation of China, while working on a transmission line between the Belo Monte Dam in Pará and southeastern Brazil, recalled the challenges of operating in such an environment:

> Land acquisition [for the transmission line] engaged 3,337 property owners, and we had to negotiate with each one of them, as well as obtain 204 inter-regional licenses, including rivers, lines, highways, railways, oil ducts, small airports, etc. The coordination between zones under different jurisdictions has been considerable.[89]

In addition, Brazil has vast and complex legal codes on labor rights and environmental protection, and the requirements can change rapidly. Brazil also has an independent judiciary and public prosecutors with an unusual degree of autonomy and power, who work with a constitutional mandate to investigate human rights and environmental violations. Finally, Brazil has very robust civil society, which was strengthened by the country's transition from a military-led regime to democracy in the 1980s. Despite finding themselves embattled under Bolsonaro's presidency, civil society organizations and movements have developed effective strategies for contesting projects with high socio-environmental risks.

Chinese companies learned rapidly that they needed Brazilian partners to navigate regulations and overcome the main hurdles to operating in Brazil. Their new strategy entailed retaining local staff, while expanding partnerships by hiring Brazilian law firms and consultants to help them deal with national and local Brazilian government officials.[90] This approach also allowed Chinese companies to better understand and learn about the intricacies of Brazil's regulatory frameworks. It further enabled them to keep abreast of fast-changing regulations and to anticipate legal changes even as relevant political discussions were taking place in Congress.

With respect to railway investments more specifically, the most important Chinese player in Brazil is the aforementioned CCCC. It is already a major investor in Brazilian railway projects, such as the Pará Railway mentioned above, and now the firm aims to expand its investments to the other key projects in Brazil, such as the West-East Integration Railway. Yet pursuing this goal has entailed a steep learning curve.

In addition to rejecting the CCCC's proposal to form joint binational Brazilian-Chinese companies to build railways, Brazil has clear guidelines on foreign investment in infrastructure. To stimulate competition and promote transparency and accountability, concessions such as railways, highways, and airports projects must be conducted through public auctions.

The CCCC has had to learn to adapt to these stringent and deeply embedded Brazilian realities. One important move was the 2016 establishment of its South American subsidiary, with headquarters in the city of São Paulo, which allowed company representatives to immerse themselves in Brazilian business culture. The following year, the CCCC bought the majority of shares in Concremat, a leading Brazilian engineering and consulting firm, with a long track record of executing successful projects in the country. This acquisition enabled the CCCC to become more competitive in Brazilian public auctions. In 2019, for instance, the CCCC won the rights to build the bridge from the city of Salvador to the island of Itaparica, a project worth $1.2 billion for what is expected to be the longest bridge in Brazil.[91] The CCCC also took charge of the port of São Luís, a major harbor in the northeast.[92] In 2019, the CCCC was considering a total of twenty-six projects, including in "ports, railways, urban development, and industry," as the company continues to gain operating knowledge on projects across a wide range of sectors.[93]

Chinese investors have also gained greater experience advocating for projects in key regulatory and public forums in Brazil. For instance, in April 2017, at a public hearing convened by Brazilian senators in favor of the Bioceanic Railway, engineers from a Chinese company spoke before Brazil's Senate Commission on Infrastructure Services, vouching for the project's technical feasibility.[94]

Because Chinese companies pursue and execute major projects abroad in alignment with Chinese government strategy, especially with respect to foreign policy, Brazilian companies and politicians have made dedicated efforts to cement political ties before proceeding with more technical collaboration. In 2016, for instance, then governor of Mato Grosso, Pedro Taques, traveled to China to sign a memorandum of understanding (MOU), thereby formalizing the partnership with the Chinese government that would give rise to the construction of the Center-West Integration Railway. The MOU was also signed by the general director of the China Railway Construction Corporation.[95] Having learned that establishing a Brazil office greatly facilitates communication with Chinese counterparts, the state secretary for infrastructure suggested that, to make progress on the project, the firm set up an office in Cuiabá, the capital of Mato Grosso, although this has not happened yet.[96]

This type of parallel engagement, with company representatives and high-level officials shaking hands on the sidelines of key meetings, has also become a recurrent practice. In 2016, when Rousseff, Xi, and then Peruvian president Ollanta Humala signed an MOU for a feasibility study of the Bioceanic Railway by China, the Brazilian state company Valec took an active part. In addition to advising the

Ministry of Foreign Relations in Brasilia, its representatives took part in preparatory meetings in Brasilia and Lima. Valec technicians also met repeatedly with Chinese counterparts during meetings organized by a logistics company called Logistics and Planning Enterprise (Empresa de Planejamento e Logistica). Contact between the Brazilian and Chinese actors was even more sustained when Valec technicians accompanied a delegation of Chinese engineers on a tour of Brazil to explain the Bioceanic Railway, traveling together on a ten-day trip of some 3,500 kilometers from Campinorte in the central-west state of Goiás to Cruzeiro do Sul in the state of Acre.[97]

A similar route was taken for the Ferrogrão project. During an official visit to Beijing, Taques met with CCCC directors in Beijing to discuss the project. He presented data on agricultural production in Mato Grosso and the demand for infrastructure to boost the region's productive sector and exports. Shortly after the visit, it was announced that the CCCC was interested in the Ferrogrão project and that it would participate in the public auction.[98] The vice president of the CCCC, Sun Ziyu, stated that expanding investment in Brazil was a priority and announced that the company's directors would make a forthcoming visit to Mato Grosso.[99]

Through these interactions, the CCCC was able to learn three main lessons. First, it acquired a better understanding of government priorities in this part of Brazil, especially in terms of export-oriented infrastructure investments and how such deals are negotiated. Second, it improved the CCCC's understanding of the rules, bureaucratic procedures, and political debates that have affected Brazil's public auction process, including those around social and environmental considerations. And third, it expanded the company's familiarity with the Brazilian government and the country's business culture, especially as it relates to the agribusiness and infrastructure sectors.

There has also been learning on the Brazilian side in terms of selling the Ferrogrão project

to potential Chinese investors, even during the coronavirus pandemic. In August 2020, a road show was organized by the PPI for actors potentially interested in the project. The event was held online, and eleven construction companies participated. These included the CCCC and the China Railway Tenth Engineering Group; Japan's Sumitomo; Spain's Acciona and Sacyr; Italy's Salini Impregilo; and Brazil's Grupo CCR (CCR Group), EcoRodovias (EcoHighways), Pátria Investimentos (Patria Investments), and Hidrovias do Brasil (Brazil Waterways).[100] At the time, these companies had the opportunity to clarify any questions they had on a range of topics related to Brazil's regulatory framework and the Ferrogrão project itself, including the procedures to be adopted in the event of construction delays, the government's communication strategy to minimize the reputational risks for bidders associated with the project's socioenvironmental impacts, and the government's plan to conduct consultations with Indigenous groups.[101]

Conclusion

Chinese railway investors have had to operate within—and adapt to—a highly dynamic Brazilian context in which regulations can change and political conditions can shift rapidly. The exchanges and mutual learning between them and their Brazilian interlocutors continue against the backdrop of sharpening debates about the sustainability of major infrastructure projects.

In the case of the Ferrogrão project, the demand for infrastructure dovetails with China's interest in expanding and diversifying its investments in Brazil. However, such a large-scale project also entails multiple risks such as environmental impacts, socioeconomic effects (including the displacement of local communities), and unforeseen economic costs. This means that such Chinese infrastructure investments are increasingly subject to scrutiny by Brazilian civil society, local communities (including Indigenous communities and other traditional groups in the Cerrado and Amazon), and political parties.

Some of the key institutional learning observed in the Ferrogrão project include working with or alongside political actors to cement political support for the project, the acquisition or hiring of Brazilian support firms to untangle the complex web of Brazilian regulations and learn about the country's business culture, the establishment of Chinese country offices in Brazil to familiarize company representatives with local business practices and culture, joint feasibility studies, and participation in controlled public forums, such as hearings and Senate debates.

As Chinese investments expand in Brazil, especially in the transportation sector, it will become even more vital for stakeholders to negotiate projects that promote inclusive and sustainable development. There are at least three ways to help reduce the socio-environmental damage that such projects exact.

First, such investments must follow international law on the right to previous consultation with local communities, including Indigenous and *quilombola* groups, as established by the International Labour Organization's Convention 169. It is important that the Brazilian federal government develops a normative and operational framework to ensure that the treaty's terms are followed. So far, this implementation has depended too much on ad hoc decisions by judges and public prosecutors.

Second, both Brazilian and Chinese actors should work to maximize institutional learning early on in projects. This can be done, for instance, by creating binational engineering teams for feasibility and environmental impact studies, so as to facilitate compliance with Brazil's complex socioenvironmental framework and avoid oversights that lead to greater risks and higher costs.

Third, civil society should organize capacity-building activities with local communities that will be impacted by Chinese investments in large-scale infrastructure so that they can develop effective

strategies to monitor these projects and exert pressure for improved outcomes via the Federal Public Ministry and the Federal Public Defender's Office (Defensoria Pública da União), for instance. There is also a need for expanded knowledge production on such projects, including through collaboration involving think tanks, research institutes, and universities from both Brazil and China.

Since most of the major infrastructure projects in Brazil are public concessions and regulated by competitive auctions, stakeholders must strive to ensure that their rules rigorously incorporate concerns about the environment and social issues, establish clear guidelines, and allocate sufficient resources for dealing with potential conflicts.

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