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The effects of the installation of a pulp mill in a small municipality and a proposal for a monitoring system

Report

Rio de Janeiro, September 2024

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Institute for Mobility and Social Development – IMDS

CEO

Paulo Tafner

RESEARCH DIRECTOR

Sergio Guimarães Ferreira

ADMINISTRATIVE-FINANCIAL MANAGER

Carolina Roiter

Technical managers

Paulo Tafner
Sergio Guimarães Ferreira

Content development team

Sergio Guimarães Ferreira
Bruna Goussain Santana
Leandro Pereira da Rocha
Giovanna Lima*
Débora Leandro*

Research associate

Vanderson Berbat

Data production

Oppen Social

IMDS

Rua Abreu Fialho 9
Jardim Botânico
22460-040
Rio de Janeiro, RJ

Institute for Mobility and Social Development

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* Oppen Social

Contents

Introduction

In recent years, the state of Mato Grosso do Sul has experienced significant economic growth, driven mainly by the agro-industrial sector and, more recently, by the expansion of the pulp industry. In particular, Vale da Celulose, located in the east of the state, has stood out due to the high concentration of eucalyptus plantations and industrial pulp plants, becoming an important production center for this sector.

Although the state has recorded remarkable economic advances, evidenced by the high growth rates of GDP per capita and the expansion of exports of *commodities* such as soybeans, corn and cellulose, these gains have not been translated into proportional improvements in social indicators. Areas such as education and health remain challenging, underlining a significant contrast between economic performance and the evolution of the state's social indicators.

The small municipality of Ribas do Rio Pardo, located in Vale da Celulose, is an emblematic case of this contrast. The recent installation of Suzano's pulp mill attracted a significant influx of investments and raised the level of jobs, boosting the municipality's revenues. However, this rapid growth has also brought challenges, such as the substantial pressure on public services and urban infrastructure, the increase in demand for housing, among other social impacts resulting from the migratory flow.

Despite the investments and efforts to mitigate these impacts, such as the implementation of a Basic Environmental Plan, signed between the Government of the State of Mato Grosso do Sul, the municipality of Ribas do Rio Pardo and Suzano, the municipal management has faced difficulties in dealing with the growing demands. The lack of technical and administrative capacity, associated with the challenges of intersectoral governance for the treatment of information and decision-making, have contributed to delays and bureaucratic obstacles in the implementation of infrastructure projects and social programs.

This report is the product of the Technical Cooperation Agreement signed between the Institute for Mobility and Social Development (IMDS) and the Government of the State of Mato Grosso do Sul, which aims to implement protocols for diagnosis, planning and monitoring of strategic actions of the State Government. More specifically, this report intends to expand knowledge about the economic and social effects generated by the implementation of pulp and paper industrial plants in the state, in order to support decision-making on policies and programs that may be affected by these projects and others of similar magnitude that may come to be carried out.

In addition to this introduction, the report consists of five sections. Section 1 describes the recent overview of some socioeconomic indicators that stand out for reflecting the disparity between economic growth and social development in the

state of Mato Grosso do Sul, Vale da Celulose and, particularly, in the municipality of Ribas do Rio Pardo.

Section 2 explores three case studies of cities that have witnessed industrial projects similar to the one in Ribas do Rio Pardo to illustrate that the installation of an industrial plant can have effects that are also seen in other contexts. Although each of the studies offers a unique perspective on local transformations, the studies reveal general trends and patterns applicable to the context of Ribas. More specifically, the studies show the same disparity observed in the state of Mato Grosso do Sul, in which economic growth driven by the installation of large industrial projects was not accompanied by advances in social development.

Section 3 characterizes the pulp and paper industry, based on the description of its main phases of implementation — planning, civil construction and operation. In this section, it is already noted that each phase of the project causes different pressures and challenges for the city and its residents, in addition to economic benefits, such as job creation and increased tax collection. However, the main objective of the section is to guide the structure of the Map of Potential Effects, presented in the following section, in order to offer information for the most efficient planning and coordination of actions throughout the project.

Section 4 presents a detailed mapping of the potential, general and specific effects associated with the implementation of a pulp and paper mill in a small municipality. The Map of Potential Effects was structured based on the implementation phases characterized in section 3 and describes the social, economic and environmental effects reported in the reference literature and collected during the IMDS technical visit[1]. In addition to the impacts directly associated with the implementation of the factory, the Map also identifies actions that require investment by the public sector. Some of these actions are propitiated by the socioeconomic transformations generated by the installation of the factory, while others represent necessary responses to the pressures exerted on the public administration. In addition to the description of these effects, we have prepared an illustrated model of this mapping to facilitate the visualization of the survey[2].

Section 5 proposes a set of priority indicators, which should be continuously monitored for the prevention and mitigation of the main risks presented in the Map of Potential Effects, in order to minimize pressures on essential public services. The selected indicators can be divided into i) risk indicators, which were chosen given their relevance to the topic and the ability to capture changes over time, and ii) revenue monitoring indicators, which signal relevant economic impacts.

In the final considerations, we highlight that the implementation of pulp mills in Mato Grosso do Sul presents both significant opportunities and challenges. This

[1] The IMDS team carried out a technical visit between October 25 and 26, 2023 to conduct directed conversations and semi-structured interviews with the management teams of the State Government and the municipality of Ribas do Rio Pardo.

[2] Available in Annex I of this document and on the Miro Platform, which can be accessed here: https://miro.com/app/board/uXjVLeIx8hY=/?share_link_id=970615315620

report provides a basis for informed decision-making, providing public managers with a management tool for anticipating these challenges and identifying priority areas, contributing to the more efficient allocation of resources and the implementation of public policies that promote economic and social development.

Finally, we present as a possibility of extension of this work the deepening of studies that support the proposition of policies to deal with some of the effects that were presented in section 4. As a preliminary work – but which requires a more detailed investigation for the elaboration of policy proposals – we highlight three strategic fronts of action that can be designed and/or improved, implemented and coordinated by the State Government, in partnership with local governments. More specifically, among the five initiatives that require investment from the public sector and that were identified in the Effects Map, we consider that three of them are promising responses to strengthen the capacity of municipalities to face the challenges imposed by the installation of a factory of this size.

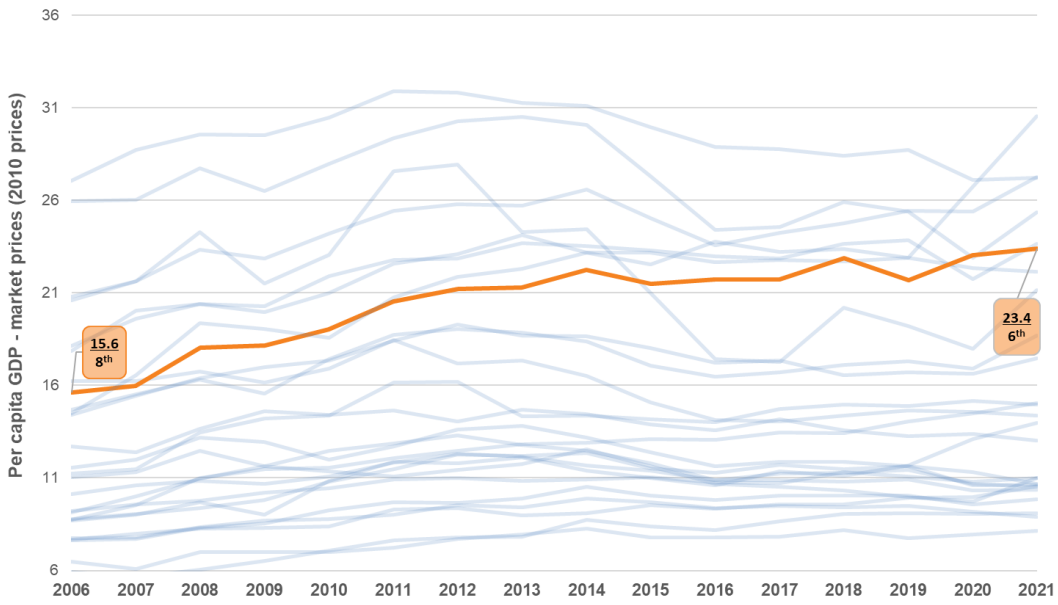
Section 1: Recent socioeconomic panorama

In this section, we explore the socioeconomic context of Mato Grosso do Sul, outlining some of the main characteristics that shape the reality of the state. With economic growth driven by the agro-industrial sector and the expansion of the pulp industry, the state faces the complex task of balancing this progress with improving social indicators. We will analyze particularities of Mato Grosso do Sul, the importance of the Pulp Valley, and specific challenges found in Ribas do Rio Pardo. This overview provides the necessary basis for understanding the impacts and social and economic dynamics related to the installation of large industrial enterprises in the region.

1.1 Mato Grosso do Sul

Mato Grosso do Sul has stood out in the national economic scenario, presenting a significant growth in per capita Gross Domestic Product (GDP). The indicator grew from R$ 15.6 thousand in 2006 to R$ 23.4 thousand in 2021, placing the state in 6th place in the national ranking, an improvement compared to the 8th place it occupied in 2006. In 2020, the state came to occupy the 4th position (Figure 1).

Figure 1. Per capita GDP at constant prices - R$ (thousand) - by UF



Note: The indicator represents the state GDP at constant prices divided by the population. The unit is R$ (thousand) at 2010 prices.
Source: Estimates produced based on data from IPEA, Ipeadata.

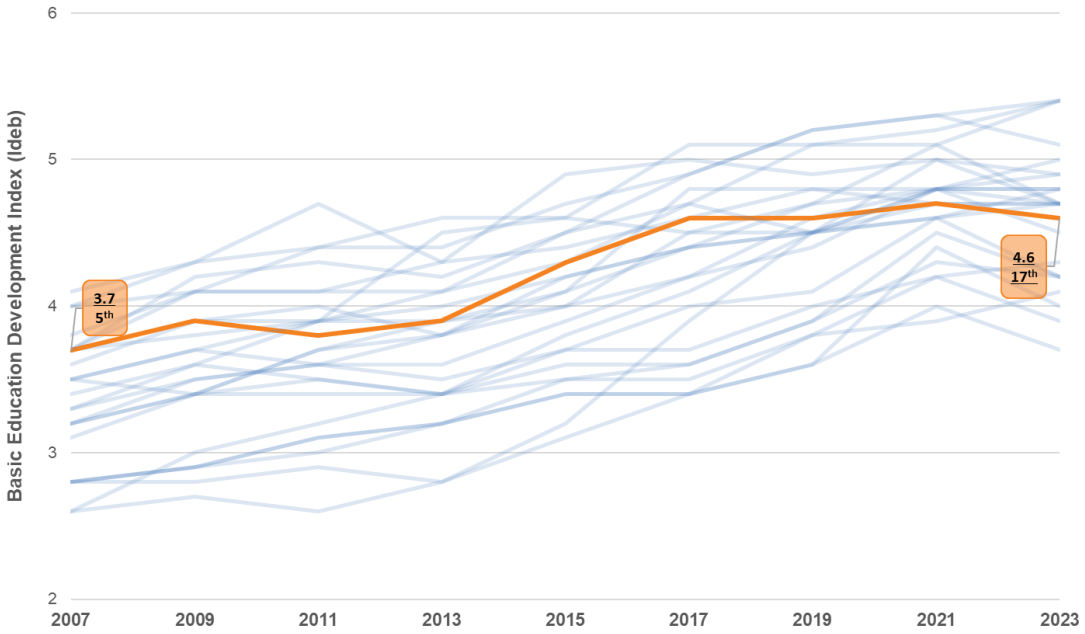
This economic growth began with the expansion of the agricultural frontier from the 1970s onwards, led by entrepreneurs from São Paulo and southern Brazil. The advancement of agricultural research and exposure to global competition have increased productivity, consolidating the state as a major food exporter.

Investments in logistics infrastructure, both road and waterway, were fundamental for this consolidation, facilitating the export of commodities.

Currently, Mato Grosso do Sul stands out as an important national exporter, with exports that exceeded US$ 10 billion in 2023[3]. The main exported products include soybeans (37%), pulp (14%) and corn (9%), evidencing the relevance of the agroindustry and, particularly, the pulp industry for the state economy.

However, this robust economic growth has not been accompanied by proportional advances in social indicators. Despite rising per capita GDP and high export figures, deficiencies in areas such as education and health remain significant challenges. The Basic Education Development Index (IDEB) in Junior High School, although it has improved, fell from 5th place in 2007 to 17th in the national ranking in 2023 (Figure 2).

Figure 2. IDEB in the final years by Unit of the Federation



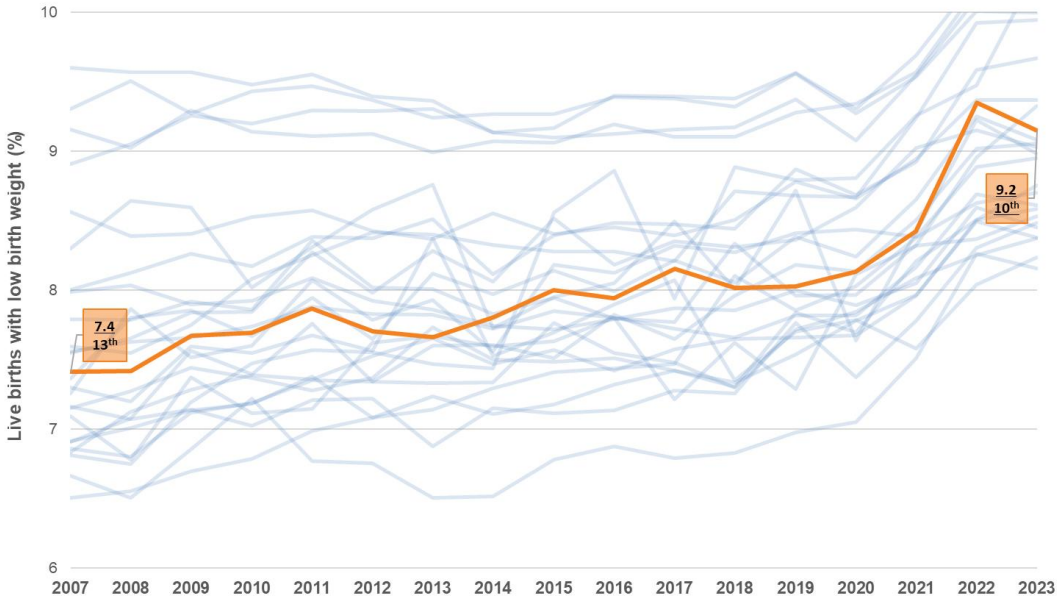
Note: The indicator corresponds to the Basic Education Development Index (Ideb) of classes in 6th to 9th grade of public junior high school.
Source: Estimates produced based on INEP/SAEB data.

The dropout rate in High School, although it has decreased, went from the 8th lowest rate in 2007 to the 18th in 2021. In addition, the age-grade distortion rate in High School, despite a significant reduction, also fell in the national ranking.

In the area of health, challenges persist, such as the increase in the proportion of low birth weight in live births (Figure 3) and the increasing rate of confirmed cases of tuberculosis, underscoring the urgency of effective interventions in this sphere.

[3] Source: Comex Stat - ComexVis (mdic.gov.br), accessed on May 2 2024.

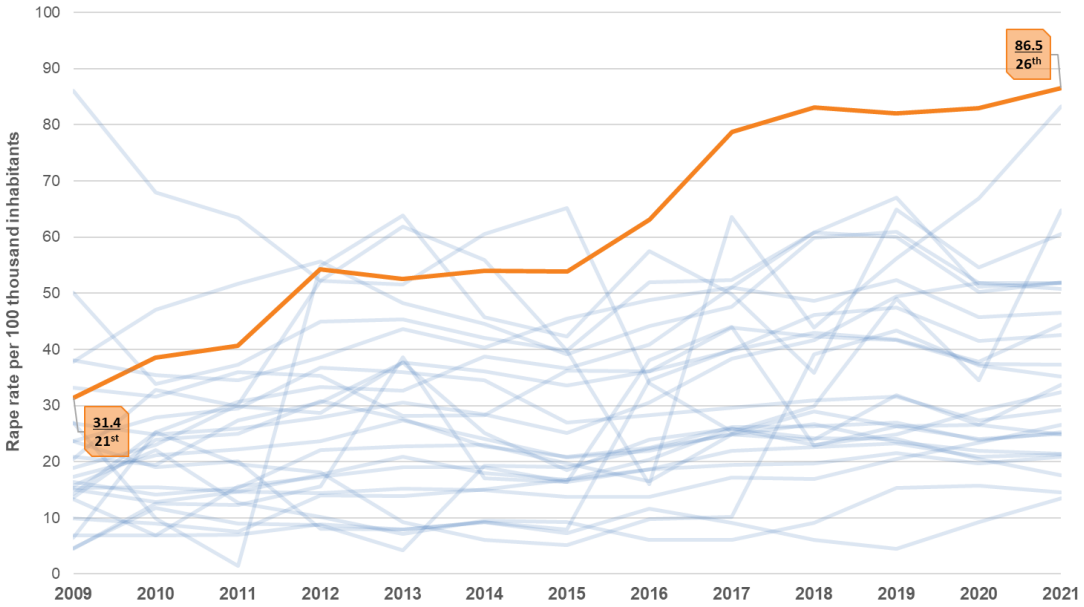
Figure 3. Percentage of live births with low birth weight by Unit of the Federation



Note: The indicator represents the number of live births with a birth weight of less than 2,500 grams divided by the total number of live births.
Source: Estimates produced based on data from DATASUS, Tabnet.

Violence against women is another serious problem identified in the state. Mato Grosso do Sul has one of the highest rape rates in the country, including vulnerable rapes, with a worrying increase from 31.4 per 100 thousand inhabitants in 2009 to 86.5 in 2021 (Figure 4), reaching the worst position in the national ranking. In addition, the rate of femicides is also alarming, registering 2.6 per 100 thousand women in 2021, placing the state in 24th place in the national ranking.

Figure 4. Rape rate per 100 thousand inhabitants by Unit of the Federation



Note: The number of rapes also includes those committed against vulnerable people. People under 14 years of age, people who have some type of mental illness and people who are not able to offer any resistance to the act are considered vulnerable.
Source: Estimates produced based on data from FBSP, Crime Statistics.

These indicators underscore the complexity of the challenges faced by the state. The impressive economic growth, represented by the evolution of per capita GDP, coexists with worrying social indicators, such as those shown in the areas of education, health and violence, underlining the need for public policies that address both economic development and social inclusion. The strategic plan outlined in the State's Multiannual Plan for 2024-2027[4] reflects this vision, with guidelines to promote sustainable development, social inclusion, and efficiency in public management.

In a way, the State of Mato Grosso do Sul repeats a phenomenon that occurred in the country throughout the second half of the 1960s until the end of the 1970s. Prodigious economic growth with degradation of social indicators. It is as if we had not learned to grow from an economic perspective with equivalent performance in social indicators. In sum, Mato Grosso do Sul repeats our history of economic growth with social exclusion and degradation of the quality of life of a significant portion of the poorest population in society.

As the trend of economic growth in the state remains promising, the local challenge – especially with the new major investments that are already announced and others that will come – will be to maintain the pace of economic growth while simultaneously raising social indicators. The challenge is to enrich and distribute wealth.

1.2 Vale da Celulose

Currently, Mato Grosso do Sul is the second largest national producer of pulp, behind only Bahia, although it leads Brazilian exports of this product. With Suzano's recently inaugurated plant in Ribas do Rio Pardo, which started operations in July this year, the state's production capacity will increase to 7.5 million tons per year, surpassing Bahia's production. By 2028, the inauguration of the first plant of the Chilean multinational Arauco in Inocencia is also planned, which will make the state double its production in the medium term, reaching a volume of 10 million tons per year.

The consolidation of this conglomerate of pulp companies is substantially transforming the economic base of Mato Grosso do Sul. This expansion process reinforces the state's emphasis on the agricultural sector, especially forestry, while adding value to the product. This movement has led to the informal recognition of Mato Grosso do Sul as the "State of Cellulose" (the Pulp State), with the eastern region, where the industrial facilities are located, being referred to as the "Vale of Cellulose" (Pulp Valley).

[4] More details at https://www.spdo.ms.gov.br/diariodoe/Index/Download/DO11351_14_12_2023_SUP_1

In the 1970s, Mato Grosso do Sul saw a significant increase in the area of planted forests due to tax incentives, highlighting the potential of land in the eastern region for forestry. Favorable climatic conditions and the reuse of previously degraded land have facilitated the development of forestry, contributing to environmental recovery and sustainable land use. According to data from the Fiems System, the state has the second largest extension of areas planted with eucalyptus in the country, contributing with approximately 24% of the national production. These plantations are distributed in several cities, including Três Lagoas, Ribas do Rio Pardo, Água Clara, Brasilândia, Selvíria, Inocência and Santa Rita do Pardo.

The abundant availability of water in the eastern region, benefited by the Paraná basin, is crucial for the industrial pulp production process. Water is used in various stages of the process, with significant reuse in semi-closed systems that preserve local water resources. Measures such as reforestation programs and soil conservation techniques reinforce the commitment to environmental sustainability.

The strategic location of Vale da Celulose, close to the main national consumer center, São Paulo, and to the main ports in the Southeast and South, facilitates exports. The flow of production is efficient thanks to multimodal logistics that includes road, rail and waterway transport, ensuring accessibility to international markets. The development scenario highlighted the Vale region for its strategic importance and leadership in the industry, represented by the factories in the municipality of Três Lagoas, the future plant in Inocência, in addition to the recently inaugurated one, in Ribas do Rio Pardo.

1.3 Ribas do Rio Pardo

The city of Ribas do Rio Pardo was chosen by Suzano to host its industrial expansion, following in the footsteps of Três Lagoas. The project to build a pulp mill in Ribas was conceived in 2013, when CRPE (Celulose Rio Pardense e Energia) obtained environmental licensing approval to build a unit capable of processing 2.2 million tons per year of bleached eucalyptus pulp[5]. This project remained stagnant until 2018, when Suzano announced its merger with Companhia Fibria, which held extensive areas of planted forest in the region. This merger revived plans for the construction of the world's largest single-line pulp mill[6] in Ribas do Rio Pardo.

In 2021, Suzano made official the start of the Cerrado Project activities[7], with an estimated investment of R$ 22.2 billion for the installation of an industrial complex capable of producing 2.550 million tons per year. This project included investments in the mill and in the acquisition and lease of land for the planting of certified eucalyptus. It is estimated that the project generated approximately 10 thousand

[5] Source: FOLDER (imasul.ms.gov.br), accessed on May 02 2024.
[6] A single-line mill is an industrial unit where the entire production process occurs continuously and sequentially, without branches, and is common in large-scale industries such as pulp and paper.
[7] Source: Suzano - Cerrado Project, accessed on February 2 2024.

direct and indirect jobs during construction[8] and that it will generate 3 thousand new jobs in the operation of the factory.

Despite its relatively modest socioeconomic condition (ranked only as the 24th largest GDP in the state in 2018), Ribas do Rio Pardo has emerged as the epicenter of this enterprise. In 2021, it already occupied the 16th position in terms of municipal GDP. The per capita GDP of the municipality jumped from R$ 35.9 thousand in 2018 to R$ 74.9 thousand.

From the point of view of tax collection, the city saw a significant increase from 2021 (Table 1). Current revenues, which were R$ 129.4 million in 2017, jumped to R$ 249.0 million in 2022 and reached R$ 310.4 million in 2023, representing a real increase of 140%. The Service Tax (ISS) showed the highest growth, reaching R$ 69 million in 2023 — an increase of 580%. The Real Estate Transfer Tax (ITBI) grew from R$5.8 million in 2017 to R$22.0 million in 2023. The Urban Property and Territorial Tax (IPTU) doubled in the same period, from R$ 0.7 million to R$ 1.4 million. In addition, current transfers also registered a consistent increase, from R$108.2 million in 2017 to R$183.3 million in 2023, reflecting the growth in transfers of funds between government spheres.

[8] According to data from the General Register of Employed and Unemployed People (CAGED), the stock of workers in January 2020 was 5,208, rising to 16,010 in August 2023.

Table 1. Municipal Revenues (in millions of R$), Ribas do Rio Pardo

Revenue	2017	2018	2019	2020	2021	2022	2023
Current Revenues	129.4	150.4	147.6	153.7	187.7	249.0	310.4
Taxes, fees and improvement contribution	19.4	37.8	28.4	22.8	40.7	76.7	110.5
IPTU	0.7	0.8	0.9	0.9	2.0	2.3	1.4
RETT	5.8	23.2	14.6	7.5	12.6	21.0	22.0
ISS	10.2	8.5	7.3	8.1	13.6	38.5	69.0
Current Transfers	108.2	110.6	117.6	129.7	142.7	163.4	183.3

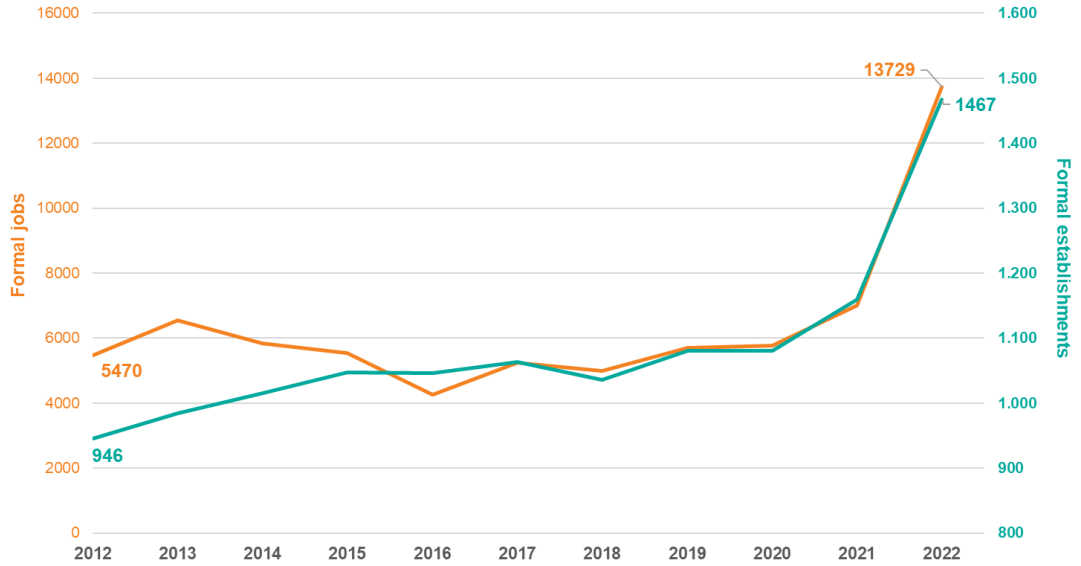
Note: Values in millions of R$ deflated at 2023 prices by the IPCA/IBGE.
Source: Estimates produced based on the Transparency Portal of the municipality of Ribas do Rio Pardo.

The productive sector, especially trade and services, experienced a period of growth, evidenced by the increase in activities related to hotels, gastronomy, civil construction and trade. The local population, which numbered approximately 24,258 inhabitants in 2018[9], has faced an abrupt increase due to the arrival of migrant workers in search of employment opportunities generated by the project. According to estimates by the municipal management, the city welcomed about 11 thousand new residents during this period of intense economic activity.

Other indicators reflect the economic warming. The proportion of formal jobs registered jumped from an average of 5,480 between 2012 and 2020 to 13,729 in 2022. The number of formal establishments also increased significantly, from an average of 1,030 between 2012 and 2020 to 1,467 in 2022 (Figure 5).

[9] Source: IBGE - Population Estimates, 2018.

Figure 5. Number of formal jobs and number of establishments.

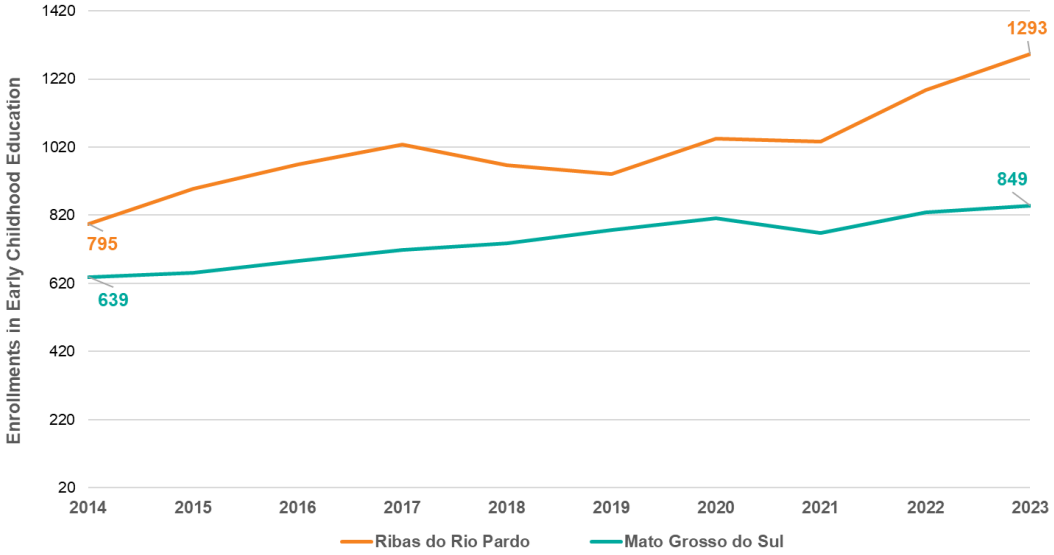


Note 1: The indicator represents the number of formal employees with active contracts.
Note 2: The indicator represents the number of establishments with active labor contracts.
Source: Estimates produced based on data from the Annual Report of Social Information (RAIS).

Despite the positive highlights of the economic indicators, during the visit of the IMDS team to the municipality, in September 2023, negative perceptions were identified about the immediate social impacts, resulting from the difficulty of local public managers in dealing with the growing demand for public services. The intense migratory flow was pointed out as the main challenge for municipal managers, especially during the initial phase of construction. During this period, services face maximum pressure, affecting areas such as education, health, housing, social assistance and public safety.

In the area of education, the number of enrollments in Early Childhood Education increased significantly from 2021, reaching 1,187 enrollments in 2022 and 1,293 in 2023 (Figure 6). This rapid growth requires additional adjustments and investments to ensure the quality and effectiveness of the education offered.

Figure 6. Number of enrollments in Early Childhood Education



Note: The indicator represents the number of children enrolled in Early Childhood Education (Nursery and Preschool). The results for the state of Mato Grosso do Sul reflect a simple average of the results of the municipalities in the state.
Source: Estimates produced based on data from the School Census – Inep.

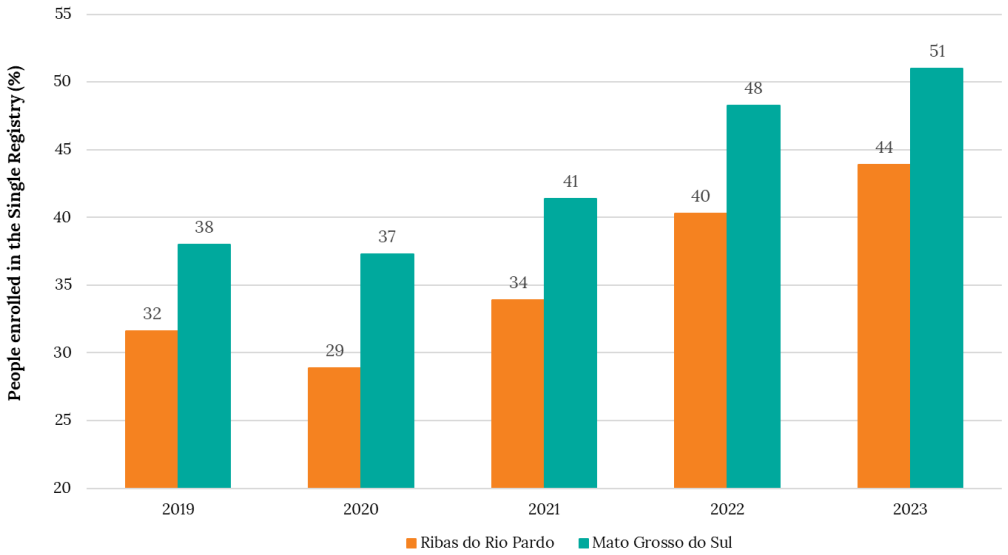
The pressure on health services is manifested by the change in the profile of care, with a greater concentration of emergency care related to work and traffic accidents. In terms of housing, the increase in rents[10] generated gentrification, expelling more vulnerable families to peripheral areas, with increased residential precariousness and informal allotments[11]. In the area of public security, an increase in violence against women was reported, although this fact has not been confirmed by the authorities of the Public Security [12]Secretariat.

Social assistance in the municipality is the most pressured area in terms of increased demand[13]. The percentage of people enrolled in the Single Registry, an instrument that identifies and characterizes low-income families in the country and a prerequisite for access to benefits and programs of the Federal Government, changed from 31.6% in 2019 to 43.9% in 2023 (Figure 7), an increase of 3.3 million registered in the municipality. In addition, the overcrowding of the halfway house was identified as a serious problem that requires immediate solution, reflecting the

[10] https://g1.globo.com/ms/mato-grosso-do-sul/noticia/2023/09/06/com-falta-de-moradia-aluguel-de-quarto-de-10m-em-ribas-do-rio-pardo-chega-a-r-12-mil-veja-video.ghtml
[11] https://www.ribasdoriopardo.ms.gov.br/publicacoes/2486/prefeitura-e-governo-do-estado-se-unem-por-mais-casas-para-ribas-do-rio-pardo
[12] The increase in femicide crimes was mentioned by some managers, but this phenomenon was not observed in the statistics. According to data and information from the Department of Public Security of Mato Grosso do Sul, crime rates are within what is expected by the corporation, with a higher incidence of thefts from homes and small confusions in front of bars.
[13] The city currently has two Social Assistance Reference Centers (CRAS) and a Specialized Social Assistance Reference Center (CREAS), a child and adolescent shelter program and a Halfway House that is managed by Social Assistance and was purchased by Suzano, as provided for in the Basic Environmental Plan.

challenges faced by the municipal management in dealing with the rapid population growth and the pressure on public services.

Figure 7. Percentage of people enrolled in the Single Registry (*CadÚnico*)



Note: The indicator represents the proportion of people enrolled in the Single Registry in relation to the estimated population. The results for Mato Grosso do Sul reflect a simple average of the results of the municipalities in the state.
Source: Estimates produced based on data from the Unified Registry/MDS and DATASUS/TabNet.

The implementation of a large industrial enterprise in Ribas do Rio Pardo generated several challenges and demands for the community and local public management. To face them, a Basic Environmental Plan (BEP) was established, the result of an agreement between Suzano, the Government of the State of Mato Grosso do Sul and the municipality.

The BEP addressed the expansion of beds in the municipal hospital and improvements in health infrastructure, resulting in an increase in the number of doctors from 14 to 53 by 2024, in addition to the construction of a new hospital for the company's employees. Housing aspects were also addressed, with Suzano building 945 homes and the city government donating an area for 4,000 homes, in partnership with the state and federal governments.

In education, the BEP included training of managers and teachers, sustainability activities, environmental campaigns, programs for local students and professional qualification courses. In public security, the plan included the construction of a police station, the renovation of Military and Federal Highway Police posts, and the implementation of a TV circuit monitoring system. For social integration, cultural and sports activities were promoted for the community and temporary workers.

However, municipal public management faced challenges due to a lack of technical and administrative capacity, resulting in delays and bureaucratic obstacles. Part of these difficulties could have been mitigated with an action plan based on a diagnosis of the effects of the installation of a pulp and paper plant. Understanding the impacts

of investments of this magnitude, and in particular of this industry, would allow mitigating the negative effects and planning policies and programs for inclusive economic growth.

Section 2: Case Studies

Case studies of cities that received industrial pulp and paper plants are essential for a detailed analysis of the economic and social impacts resulting from this type of investment. Each case study offers a unique perspective on local transformations, allowing you to identify specific variables that influenced both success and the challenges and problems faced.

Despite the particularities of each city, the studies reveal general trends and patterns applicable to the context of this study, which seeks to understand the effects of the implementation of an industrial pulp and paper plant in a small municipality. These studies were developed based on a comprehensive literature review and the analysis of socioeconomic indicators made available by the IMDS Municipal Elections Dashboard[14].

Based on the studies, we selected three cases of municipalities impacted by projects in the pulp and paper industry, namely, Três Lagoas, in Mato Grosso do Sul, Imperatriz, in Maranhão, and Ortigueira, in Paraná.

2.1 Três Lagoas (Mato Grosso do Sul)

The municipality of Três Lagoas, in Mato Grosso do Sul, has become an important hub for the pulp and paper industry, especially since the 2000s, with the arrival of three large plants. The transformation began with the construction of the Fibria plant between 2006 and 2009[15]. In 2010, Eldorado began construction of its plant, which was completed in 2012[16]. In 2016, Fibria expanded its production[17] and, in 2018, was incorporated by Suzano[18]. In 2023, Suzano's two mills in Três Lagoas reached a production of 30 million tons of pulp in 14 years of operation, a historic milestone in the sector, being the first unit in the world to reach this milestone in such a short time[19].

The arrival of these factories intensified the economic dynamism of Três Lagoas, especially during the construction and expansion of the factories, generating jobs and increasing local income. The per capita GDP of the municipality grew

[14] Available in https://imdsbrasil.org/
[15] Fibria was created as a result of the merger of Aracruz Celulose S.A. by VCP and as a company resulting from this merger it began operations in September 2009, with a capacity of 1.3 million tons per year, called the Horizonte Project. The technological evolution of the pulp and paper sector in Brazil. Edison da Silva Campos; Celso Foelkel – ABTCP – Brazilian Technical Association. 2017. p. 119; 167.
[16] Eldorado Brasil Celulose built what was classified at the time as the largest pulp plant in the world in a single fiber line, with a capacity of 1.5 million tons per year, put into operation at the end of 2012. Ibid., p. 119.
[17] Fibria's second production line, called Projeto Horizonte 2, added 1.95 million tons per year to the 1.3 million tons that had already been produced since 2009. Ibid., p. 166.
[18] Information published by the Newspulpaper media, of the Brazilian Technical Association of Pulp and Paper, available at: https://newspulpaper.com/suzano-anuncia-aprovacao-final-da-fusao-com-a-fibria/
[19] Information published by the Newspulpaper media, of the Brazilian Technical Association of Pulp and Paper, available at: https://newspulpaper.com/suzano-alcanca-30-milhoes-de-toneladas-de-celulose-produzidas-em-tempo-recorde/

significantly, from R$ 22,782 in 2006 to R$ 47,998 in 2012, which represents an average annual rate of 13.22%, and maintained a robust growth until 2018.

The operation of the plants created employment opportunities and encouraged technical and professional training[20]. Between 2006 and 2013, the number of formal jobs per 100,000 inhabitants increased substantially, reflecting the economic dynamics driven by industrial investments. Municipal tax collection, which is essential for financing essential public services, also showed significant increases, such as the per capita ISS, which went from R$65 in 2006 to R$442 in 2012.

Despite the economic growth, the implementation of the factories brought significant social impacts. The population of Três Lagoas has grown remarkably. In 2005, the resident population was 85,886 and in 2013 it jumped to 109,633, a growth of 27.64%.[21] This increase in population increased the demand for real estate and inflated prices, resulting in the displacement of the poorest population to peripheral regions.[22] Studies have documented the arrival of migrant workers, and the challenges related to housing, with housing and workers' dormitories presenting precarious conditions.[23]

Pressure on public services has increased due to population expansion. Health indicators reflected a drop in quality of life. The number of hospitalizations for diseases related to inadequate environmental sanitation for children aged 0 to 4 years[24] per 100 thousand inhabitants increased, from 722 in 2012 to 837 in 2015. Sanitary sewage[25], a set of infrastructures and services essential for public health and the quality of life of the community, was also impacted, with significant improvements only after 2016, when it reached 60%, a level that was reached by the capital Campo Grande in 2010.

The data presented reveal a scenario of great economic and social transformation resulting from the installation and expansion of pulp and paper plants. The industry has brought significant economic growth and job creation, but it has also triggered

[20] One of the examples is Fibria's Forest Learning Program, developed in partnership with SENAIS/MS: https://newspulpaper.com/fibria-investiu-mais-de-r-53-milhoes-em-treinamentos/. Another example is Suzano's Formare Program: https://newspulpaper.com/suzano-conclui-primeira-turma-do-programa-formare/

[21] https://sidra.ibge.gov.br/tabela/6579#resultado

[22] DA SILVA, João Luiz. The territorial effects of capital expansion and the transformation of urban space in the city of Três Lagoas-MS between the years 2000 and 2020. 2021.

[23] PERPETUA, Guilherme Marini et al. The spatial mobility of capital and labor force in the production of pulp and paper: a study from Três Lagoas (MS). 2012.

[24] The indicator represents the number of hospital admissions of children aged 0 to 4 years due to diseases related to inadequate environmental sanitation (ICD 10: A00 to A04, A06 to A09, A27, A71, A90, A91, A95, B15, B35, B36, B50, B54, B55, B57, B65, B67 to B69, B71, B74, B76 to B83, H10) for every 100 thousand inhabitants, in the reference period. For the calculation, a division is made between the number of hospitalizations due to diseases related to inadequate sanitation and the estimated population aged 0 to 4 years in the municipality, multiplying the result by 100 thousand. IMDS Municipal Elections.

[25] The indicator corresponds to the percentage of the population with sanitary sewage coverage at home, that is, the availability and maintenance of infrastructure and operational facilities necessary for the adequate collection, transportation, treatment and final disposal, from the building connection to the final destination for the production of reused water or its proper discharge into the environment), in the reference period. IMDS Municipal Elections.

a series of social challenges and pressures on public services, which have needed attention over the years.

2.2 Imperatriz (Maranhão)

The municipality of Imperatriz, in Maranhão, was selected by Suzano for the installation of one of its industrial plants, whose construction began in 2011 and was completed in 2013[26]. This installation brought numerous positive impacts to the municipality, including a significant growth in per capita GDP, which went from R$13,111 in 2011 to R$20,168 in 2013, with an average growth rate of 24% per year, surpassing the growth of the capital São Luís in the same period[27].

The local economy was boosted by the generation of jobs during the construction of the factory and by the creation of permanent opportunities in the operation of the production chain. The number of formal jobs per 100,000 inhabitants increased from 24,922 in 2010 to 33,775 in 2013. In addition, Suzano promoted technical and professional training programs[28], attracting companies that supply goods and services and multinationals to the region.

Suzano's installation also boosted municipal tax collection. The per capita ISS increased from R$82 in 2011 to R$231 in 2013. The municipality's exports grew significantly, from US$ 1,794,525 in 2013 to US$ 581,926,337 in 2016, putting Imperatriz on the map of Brazilian exports and strengthening its economy.

The municipality of Imperatriz, an important center of commerce and services in the Metropolitan Region of Southwest Maranhão, saw this concentration increase with the arrival of Suzano. The increase in demand for services and the supply of specific jobs in industry accentuated regional development, although concentration also brought challenges related to quality of life and urban infrastructure.

The social impacts were significant, with the population increasing from 236,691 inhabitants in 2009 to 251,468 in 2013[29]. The population increase put pressure on public services and coincided with lower prenatal coverage and increased infant

[26] At the beginning of its operation, this plant had the capacity to produce 1.5 million tons of eucalyptus pulp per year. (The technological evolution of the pulp and paper sector in Brazil. Edison da Silva Campos; Celso Foelkel – ABTCP – Brazilian Technical Association. 2017).

[27] The high growth has already been portrayed in other works. See: SOUZA, José Roberto Ferreira de. Industrialization and socioeconomic development in Imperatriz do Maranhão: evaluation exercise through a non-traditional index. 2020.; PIETRAFESA, Pedro Araújo. The new industry of the southwest of Maranhão: socioeconomic impacts in the city of Imperatriz-MA. 2019; and OLIVEIRA, Tony Sousa. Production of urban space: the City of Imperatriz after the implementation of the Suzano Pulp and Paper Factory. 2019.

[28] Suzano Pulp and Paper, in partnership with the National Service for Industrial Learning (SENAI), the Federation of Industries of the State of Maranhão (FIEMA), the Government of the State of Maranhão, the City Hall and other entities, launched the People Training Program (CAPACITAR), which aimed to meet the demands of companies and industries in the region. above all, the construction of the pulp industrial plant in Imperatriz. https://www.fiema.org.br/noticia/885/programa-capacitar-da-novas-oportunidades-aos-moradores-do-sul-do-ma

[29] https://sidra.ibge.gov.br/tabela/6579#resultado

mortality. The proportion of live births with 7 or more prenatal visits[30], which is an indicator that reflects adequate prenatal coverage according to the World Health Organization, fell from 42.46% in 2012 to 36.74% in 2013.

In addition, Imperatriz faced significant challenges in education policies, with the increase in the proportion of out-of-school adolescents aged 15 to 17, from 13.3% in 2012 to 15.07% in 2014. Another important indicator associated with young people that showed a jump in this period is teenage pregnancy. The proportion of mothers aged between 10 and 19 years was 3.72% in 2012 and increased to 4.09% in 2014, representing an increase of 10%, reflecting additional challenges for the municipality's health and education policies.

2.3 Ortigueira (Paraná)

In the last ten years, Ortigueira, Paraná, has received large investments from Klabin in the pulp and paper industry, which took place in two stages: Puma I (2014-2016) and Puma II (2019-2023).[31] Unlike Imperatriz and Três Lagoas, Ortigueira did not see a significant increase in the resident population. In the past, this phenomenon had already been observed, when the region became economically dynamic with the installation of Klabin's first unit in Telêmaco Borba in the[32] 1940s, attracting workers from the region itself[33].

For the civil construction phase of Puma I, the migrant workers were mostly young men with low education and little formal qualification, coming from nearby rural areas, who abandoned low-paid agricultural or temporary activities, benefiting from the demand for labor in civil construction. [34]

It is worth highlighting, in accordance with the literature mentioned above, which underscores employment of workers from the region itself – that it would characterize a pendulum flow and justify the stability of the resident population of Ortigueira – the growth observed in one of the municipalities bordering Ortigueira, such as Telêmaco Borba, in the periods that preceded the works in Ortigueira[35]. This seems to suggest that a portion of the workers, attracted by the economic

[30] The indicator represents the proportion of live births whose mothers received seven or more prenatal consultations during pregnancy, indicating a prenatal coverage considered adequate by the World Health Organization (WHO), in relation to the total number of live births, in the reference period. For the calculation, a division is made between the number of live births to mothers with seven or more prenatal consultations and the total number of live births, multiplying the result by 100.
[31] The technological evolution of the pulp and paper sector in Brazil. Edison da Silva Campos; Celso Foelkel – ABTCP – Brazilian Technical Association. 2017.
[32] The municipalities in the region of Telêmaco Borba are Ortigueira, Ventania, Tibagi, Telêmaco Borba, Reserva, Imbaú and Curiúva. https://www.ibge.gov.br/geociencias/organizacao-do-territorio/divisao-regional/15778-divisoes-regionais-do-brasil.html?edicao=16163&t=downloads
[33] CUNHA, Anacília Carneiro. The paper man: Historical analysis of the worker of the Klabin industries of Paraná de Celulose S/A. 1942-1980. 1982.
[34] CRUZ, Mailane Junkes Raizer da. In the shade of the eucalyptus: socio-environmental impacts and social dynamics in the municipality of Imbaú, Paraná. 2016.
[35] https://sidra.ibge.gov.br/tabela/6579#resultado

opportunities generated by the industrial projects, settled in neighboring municipalities.

In the same way as Três Lagoas and Imperatriz, Ortigueira presented significant economic results. During the first expansion of the Puma project (2014-2016), GDP per capita grew by 35.25% per year. From 2014 to 2021, the growth was 23.5% per year, and exports increased dramatically from US$ 803,700 in 2014 to US$ 265,568,708 in 2016. Tax collection also grew, with per capita ICMS going from R$514 in 2014 to R$4,348 in 2021, and per capita ISS rising from R$555 in 2014 to R$2,243 in 2021.

However, social indicators showed an increase in the vulnerable population. From 2019 to 2022, the population registered in the Single Registry went from 63.15% to 75.36%, reflecting an increase in demand for social assistance programs. The homicide rate per 100 thousand inhabitants[36] increased from 18.07 in 2019 to 50.49 in 2021, surpassing the rate in the capital Curitiba and in the state of Paraná.

Health indicators also presented worrying numbers. The infant mortality rate[37] increased from 9.09 in 2019 to 29.59 in 2022. Mortality related to primary care-sensitive causes[38] rose from 280 in 2019 to 353 in 2022, while in the state of Paraná the indicator was 302. These data highlight significant challenges in the area of public health and safety in Ortigueira after the installation and expansion of Klabin's pulp and paper industrial plants.

[36] The indicator represents the number of deaths due to aggression and legal intervention (ICD 10: X85-Y09, Y35) per 100 thousand inhabitants in the reference period.
[37] The indicator represents the number of infant deaths (children under 1 year of age) for every thousand live births in the reference period. For the calculation, a division is made between the number of infant deaths and the total number of live births, multiplying the result by one thousand.
[38] The indicator represents the number of deaths caused by ambulatory care-sensitive conditions, those that could be prevented or managed effectively in the first contact with the health system, for every 100 thousand inhabitants, in the reference period. More information is available in Ordinance No. 221/2008 released by the Ministry of Health: <https://bvsms.saude.gov.br/bvs/saudelegis/sas/2008/prt0221_17_04_2008.html>. For the calculation, a division is made between the number of deaths caused by conditions sensitive to primary care and the estimated population in the municipality, multiplying the result by 100 thousand.

Section 3: Characterization of the pulp industry

The pulp industry is fundamental for the manufacture of paper and is characterized by its geographical proximity to the areas where eucalyptus is planted, the main source of raw material. This strategic location aims to optimize transportation and minimize the logistical costs associated with moving the wood to the manufacturing units. The quality of the soil and the favorable climate in certain regions directly influence the productivity of eucalyptus forests, impacting the operational efficiency of the mills.

Brazil has an abundance of resources compatible with the installation of a highly productive pulp industry, as the activity is favored by the extensive availability of areas conducive to eucalyptus cultivation and favorable climate. A long tradition, which began in the 70s in the last century, of cutting-edge research in the area of biotechnology in general, and a dynamic and innovative agro-industrial sector that adopts the best technologies, completes the general picture. In fact, the main companies in the sector stand out not only for the production of high-quality pulp, but also for sustainable forest management practices and industrial operations. This sustainable approach is essential for the maintenance and expansion of the sector, ensuring long-term economic and environmental viability.

At a global level, the pulp industry plays a crucial role in the economy of several countries, providing not only products, but also generating jobs and promoting socioeconomic development. Its strategic importance is evident in the global supply chain, with pulp being a widely traded commodity used in a variety of industrial sectors.

The development of the pulp industry is intrinsically linked to the capacity for innovation and adaptation to the demands of environmental sustainability and production efficiency. In Brazil, this sector has shown resilience and continuous growth, contributing significantly to the national economy and positioning the country as one of the main global pulp producers. Brazil is the second largest pulp producer in the world, with 25 million tons produced (2021), behind only the United States (49.7 million), and leads the export ranking, with 8.4 billion dollars (2022). About 76% of the pulp produced is exported. The main market for which Brazilian pulp is destined is China (with about 40% of the exported value). [39]

3.1 Phases of implementation of a pulp enterprise

The implementation of an industrial complex for the large-scale production of pulp follows a process divided into three main phases: planning, civil construction and operation. Each of these stages entails different types of socioeconomic impacts, resulting in varying pressures on local public services. The objective of this section is to describe the phases that make up the implementation of a plant in this industry and to guide the structuring of the Map of Potential Effects, presented in the

[39] The data in this paragraph were taken from the Annual Report – 2023, Ibá. https://iba.org/datafiles/publicacoes/relatorios/relatorio-anual-iba2023-r.pdf. Accessed on August 23 2024.

following section, in order to offer information for the planning and more efficient coordination of actions throughout the project.

During the planning phase, technical studies, obtaining licenses, and preparing detailed projects are carried out. This phase is crucial to ensure that all technical, environmental, and social aspects are considered before construction begins.

In the civil construction phase, the demand for labor reaches its peak, with the need for thousands of workers during the period of greatest intensity. This phase involves the construction of the infrastructure necessary for the operation of the plant, such as road access, rail connection, water collection and treatment, as well as effluent and industrial solid waste treatment systems. In addition to the permanent facilities, several temporary facilities are required during the construction phase to accommodate workers and provide logistical support, including cafeterias, living quarters, social centers, construction offices, and fuel stations. The completion of the work involves the demobilization of these temporary facilities and the restoration of the site to its original conditions, ensuring the sustainability and environmental compliance of the project.

In the operation phase, the pulp mill reaches its full production capacity. The operation requires a significant number of workers, including in-house and outsourced employees, and the logistics of transporting the raw material is planned to optimize efficiency, with integrated road and rail transport to transport pulp production.

3.1.1 Planning

The planning stage of a large-scale pulp industrial enterprise is a complex process, which can be subdivided into three main subphases, each essential to ensure the success of the project.

The first subphase is the definition of the land for the construction of the industrial complex, which requires an extensive range of studies and research, especially in the selection of the site. The studies for the definition of micro location consider four essential premises: the proximity of an area suitable for the development of a forest park, regional conditions favorable to the economic viability of the project, potential for socioeconomic improvement in the region and compliance with environmental legislation. In addition, technical-operational aspects are evaluated, such as road and rail infrastructure, electricity supply, availability of water resources and environmental restrictions.

The second subphase is environmental licensing, which involves obtaining the Provisional License (PL) and the Installation License (IL). The Preliminary License (PL) marks the beginning of the environmental licensing process, where the responsible agency – in this case, the Environment Institute of Mato Grosso do Sul (IMASUL) – evaluates the location and design of the project, ensuring its environmental viability. In this phase, the fundamental requirements for the next

steps are defined and the adequacy of the proposed area is analyzed, according to Municipal Zoning. Environmental studies, such as the Environmental Impact Study (EIS) and the Environmental Impact Report (EIR), may be requested to ensure that the project meets current environmental standards. The IL is requested after the detailed preparation of the initial project and the definition of environmental protection measures. It authorizes the start of construction of the project and the installation of equipment, requiring that the execution of the project strictly follows the model presented, with any modification being communicated to the responsible body.

The third subphase is basic engineering, in which the main parameters and characteristics of the project are established. Detailed studies and technical analyses define the layout of the plant, the production processes, the necessary equipment, the infrastructure facilities, the control and automation systems, as well as environmental, safety and regulatory issues. The goal is to develop a robust preliminary design that serves as a basis for the subsequent stages of detailed engineering, construction and operation of the plant.

3.1.2 Construction

The civil construction phase of a pulp industrial complex involves the construction of several essential structures, such as administrative and service buildings, towers, chimneys, and paving. In addition, it covers the creation of a comprehensive internal and external infrastructure, which includes road accesses, railway branches, facilities for receiving inputs, water collection and treatment, and the treatment and proper disposal of effluents and industrial solid waste.

This stage is characterized by intense civil construction activity that drives the local labor market, generating many temporary jobs, both direct and indirect. Historically, the civil construction of projects of this size attracts a significant immigration of workers or commuting migrations of people who live close to the region of the work. During the peak of construction, the demand for labor can reach thousands of workers, who are usually low-skilled and employed in construction. For small municipalities, this supply of labor heats up the local market and tends to spread its impacts throughout the region, which meets both the consumption of workers and the needs of industry.

Civil construction is marked by the largest number of interventions, resulting in significant impacts on the social, economic and environmental reality of the city. The large number of workers employed in this phase severely puts severe pressure on the city's public services and infrastructure, requiring considerable effort from government agencies and the general population to address these challenges.

After the completion of the works, the temporary labor hired for the construction is gradually disconnected, and workers who do not reside in the region usually return to their origins or often head to other large construction projects in the country. This process leads to a decrease in the demand for goods and services, resulting in

a decline in the income previously generated and the closure of service companies that were established during the construction period.

3.1.3 Operation

In the operation phase, the composition and profile of the workforce changes substantially compared to the civil construction phase. Operating a pulp industrial complex requires a smaller but more specialized workforce. A significant part of the workers needed for the operation have high specialization.

As in the construction phase, regional commerce tends to benefit significantly from the emergence of demands directly related to the operation of the factory and indirectly, through the consumption generated by the workforce associated with the activity. There will be an increase in the demand for products and services from local commerce, serving a more educated population with greater purchasing power, who will move to the city to work in the administration and management positions of the factory. This economic dynamism can result in the opening of new small and medium-sized companies, as well as the strengthening of established ones, leading to a growth in the number of jobs in the region.

The economic intensification of the city has been remarkable since the implementation phase and should be maintained during the operation phase of the factory. Pulp manufacturing acts as a powerful economic driver for the municipality and the state, through the acquisition of inputs and services from the local economy and the increase in tax collection.

The demand on municipal public services is significantly impacted by the new profile of workers in the operation stage. While in the construction phase many workers arrived in the city without their families, the operation phase usually involves the arrival of workers accompanied by their families, including school-age children and youth. This phenomenon exerts considerable pressure on the supply of vacancies in basic education units.

In addition, there is an increase in demand for cultural, leisure, and entertainment activities, resulting in greater use of public spaces and a diversification in the services and products offered by local businesses. The health area also faces greater demand, with an increase in basic care to the detriment of emergency care.

Another critical point in the operation phase is the considerable increase in the circulation of vehicles, especially trucks and trailers, on the main access roads to the project and on the internal roads of the city. This amplifies the risk of accidents and requires an intensification of signaling and specific traffic maintenance by the competent authorities.

Section 4: Potential Effects

After characterizing an industrial pulp production project, this section maps the potential effects, general and specific, of the implementation of a large plant in small municipalities, which are associated with each of the phases of the project. The analysis covers the social, economic and environmental impacts of the plant, and serves as a tool for managing risks and taking advantage of the opportunities created from the new dynamics that result from the installation of the plant. In addition, this mapping allows the creation of indicators for the continuous monitoring of impacts based on concrete evidence.

This section was constructed from the results of the literature review and reports collected during the technical visit, with the objective of identifying the possible impacts arising from the implementation of this specific type of project.

4.1 Materials and methods

The methodology for mapping the potential effects of the implementation of a pulp mill was defined based on the identification of the phases planned for the project. The investigation was conducted from a qualitative approach, focusing on the identification of relevant documents and information.

To map the most relevant effects, a literature review was carried out in digital databases, aiming to identify technical documents, impact reports and studies that meet the following criteria: a) deal with the implementation of a pulp mill in a Brazilian municipality; b) address concrete and/or potential impacts generated by the project.

The documents were prioritized in three categories:

- Environmental Impact Reports (EIR): Present the main information and conclusions of the Environmental Impact Studies (EIS).
- Specific technical documentation: Regarding the implementation of the pulp mill in the municipality of Ribas do Rio Pardo/MS.[40]
- Quantitative and qualitative research: Analyzes the impacts of the case studies explored in Section 2, which are those of Três Lagoas (MS), Ortigueira (PR) and Imperatriz (MA).

35 documents were selected, including 8 environmental impact reports (EIR), 14 technical documents of the Cerrado Project and 15 quantitative/qualitative research studies, including articles, monographs, theses and dissertations. The selection aims to offer an overview of the topic, without exhausting the sources of information.

In addition, reports collected during the IMDS technical visit provided structured information with representatives of the Secretariats at the state and municipal

[40] Documentation referring to the original project conceived for Celulose Riopardense e Energia (CRPE Holding) and later acquired by Suzano Papel e Celulose.

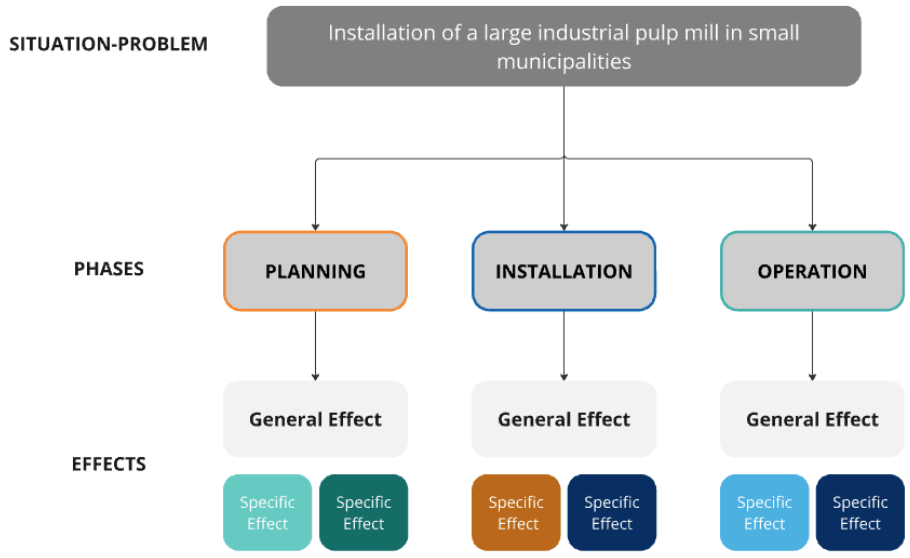
levels, contributing with important inputs to the report. After reviewing the literature and surveying the reports, the relevant information was organized in a Map of Potential Effects, an illustrated diagram, whose construction and organization will be detailed in the next topic[41].

4.2 Map of Potential Effects

The Map of Potential Effects represents the organization, in an illustrated format, of the effects found in the information collected during the review and the technical visit, from the phases of the industrial enterprise. Its objective is to present in a structured way the positive and negative impacts resulting from the installation of a pulp mill commonly referenced in the literature, many of which are consistent with the effects mentioned during the technical visit.

The elaboration of the Map consisted of the identification and organization of general and specific effects, by phases of implementation and by thematic areas, using different colors to facilitate understanding (Figure 8).

Figura 8: Structure of the Potential Effects Map



Source: Prepared by the authors.

The effects were categorized into two types: general and specific. 13 general effects were mapped distributed among the three phases, including Demographic Change, Economic Development, Increase in Tax Collection, Infrastructure Development, Pressure on Essential Services, Pressure on Public Management and Environmental Impacts, among others. From these general effects, 77 specific effects unfold.

[41] Available in Annex I of this document and on the Miro Platform, which can be accessed here: https://miro.com/app/board/uXjVLeIx8hY=/?share_link_id=970615315620

It is essential to emphasize that the term "effects" covers both the direct impacts of industrial activities and initiatives that require investments by the public sector. Among the actions that require public contribution, the following stand out: i) the development of logistics infrastructure; ii) the creation and development of infrastructure for Research and Development (R&D); iii) the provision of training and professional qualification for the local population; iv) the technical training of public management; and v) the implementation of governance mechanisms for data management.

In addition, the specific effects were classified into areas of interest to simplify the proposition of monitoring indicators and data capture, which are the objects of the following section. The areas are Demography, Family Support, Environment, Local Economy, Education, Urban Planning, Health, Sports, Culture and Leisure, and Security.

Once the structure and organization of the Map is understood, the mapped effects are defined and characterized, exploring the materialization of the impacts on the various social, economic and territorial aspects.

4.2.1 Planning Phase

The planning phase of a pulp mill involves processes such as feasibility analysis, definition of the installation site, obtaining licenses and technical analyses for a preliminary basic engineering project, in addition to the public disclosure of the project. In this phase, 6 specific effects related to the generation of expectations in economic actors were mapped.

The disclosure of the implementation of a pulp mill can generate great expectations of socioeconomic development, attracting economic actors that can impact the region in the initial phase of the project. One of the main effects is the increase in demand for land for the implementation of the factory, including large areas for planting trees, which generates real estate appreciation and increased transactions with rural properties. The timing with which this occurs often precedes the planning phase, as news of the possible installation of the factory already encourages a cycle of real estate speculation. This movement involves high investments in scarce land and the significant appreciation of land in the region.

The expectation of population growth and the arrival of workers and investors drive the emergence and expansion of businesses, while increasing the demand for products and services. This results in the development of local businesses, increasing the dynamism of the local economy and creating job opportunities.

Even before the start of the works, there is an increase in municipal tax collection due to the growth of economic activities, acquisition and transfer of properties and expansion of the service sector. Specifically, there is an increase in the Rural Territorial Property Tax (RTT), motivated by the appreciation and new investments in land. There is also an increase in the Tax on the Transfer of Real Estate (RETT), generated by the increase in real estate activity. In addition, the Service Tax (ISS)

tends to grow due to the expansion and growth in demand in the local service sector.

The generation of expectations, the increase in territorial demand, economic development and the growth of tax collection transforms local dynamics, creating opportunities, but generating challenges for the subsequent phases, which need to be managed strategically to maximize benefits and mitigate negative impacts.

4.2.2 Installation Phase

The installation phase involves several steps such as the preparation of the land, the creation of temporary resources to carry out the works and receive the workers, the construction of permanent infrastructure and the installation of industrial equipment and production systems. During this phase, 54 specific potential effects were mapped distributed over ten general effects, with emphasis on the large migratory flow expected during the construction period.

One of the main effects is demographic change, characterized by a high contingent of migration, especially of young men, attracted by the prospect of new jobs. This population increase can put pressure on local services and affect areas such as education, health, housing, social assistance, and public safety. The arrival of migrant workers is a widely documented effect on similar ventures and can result in complex challenges for municipal infrastructure and services. These temporary workers often face difficulties in social integration, which can affect crime indicators in the region.

In terms of the labor market, the installation phase generates a significant increase in the number of direct and indirect jobs, mainly of a temporary nature. The factory requires a wide range of professionals for the civil construction and assembly sectors, as well as professionals from various specialties that involve areas such as planning, structural projects, supervision and management, logistics, information technology and forestry.

The high demand for labor in the project during the installation phase can generate a shortage of labor in local businesses and, especially, of qualified professionals, which can lead to the importation of professionals. The provision of training and professional development programs, by the public initiative, can respond to the demands of the factory while contributing to the improvement of employability, wages and social inclusion of the local population.

Economic development during the installation phase results in the creation and expansion of local businesses, intensification of demand for products and services, and increased per capita income. The installation of the factory stimulates the local economy, generating a series of opportunities for the creation of new businesses to meet the demand of temporary workers, enhancing investments in various sectors, such as food, accommodation, transportation, leisure and culture. In addition, the

factory itself demands a series of inputs that can boost local suppliers and attract new investors.

As in the previous phase, during the installation there is also an increase in the collection of tax on rural property (RTT), transfer of real estate (RETT), urban property (IPTU), services (ISS) and commercialization (ICMS). This increase in tax collection is the result of real estate appreciation, increased real estate transactions, construction of new properties and expansion of economic activities, contributing to the increase in municipal and state revenues.

The installation phase can also enable public investments in the development of logistics and urban infrastructure, with the construction and improvement of highways and urban roads, investment in energy, water, sewage and telecommunication networks, and increased investment in essential services. These investments represent another public initiative that responds to population growth and the demands of the factory - improving the logistics of cargo and people in the municipality and in the surrounding areas of the project - while increasing the chances that other private investments can be constituted in the region, attracted by better conditions of logistics and urban infrastructure.

The social changes resulting from the installation phase include not only positive aspects, such as increased cultural diversity, but also negative ones, such as the potential increase in crime, domestic violence and child exploitation, and increased social tension due to rapid population growth. The arrival of workers from different regions brings new cultures and traditions, transforming the identity of the local community and creating challenges in social integration.

The pressure on essential services such as health, education and social assistance is intense during the installation phase. In the absence of public planning that considers the consequences of rapid population growth, the risks of work-related accidents, the increase in cases of respiratory and infectious diseases, as well as diseases resulting from the lack of infrastructure, can overload health services. The arrival of new workers can add to a pre-existing scenario of scarcity of physical space, equipment, supplies and human resources, which can deepen the overload on health services.

The increase in demand for emergency rooms and patient transport is linked to the increase in the number of emergency care, while the demand for immediate care is associated with less severe cases, but which require rapid care. There may be a greater demand for care in cases of greater or lesser complexity due to the increased exposure of workers to occupational risks and work accidents during the construction of the factory. The risks can be accidental, due to the handling of unprotected machinery and equipment, inadequate storage, risk of fires; physical, such as exposure to high temperatures and excessive noise; of an ergonomic nature, by lifting heavy weights, working long hours, doing repetitive movements; chemical,

by exposure to substances, compounds and products that can penetrate the body by ingestion or through the respiratory tract; and of a biological nature, due to exposure to biological risk agents such as bacteria and fungi. The exposure of workers to work-related risks, accidents or diseases can overload the health system, saturate care units, and put greater demand on already scarce resources.

The increase in infectious and respiratory diseases also increases demand and can overwhelm medical care in health facilities. The number of people in precarious housing conditions without adequate infrastructure – access to drinking water, basic sanitation, garbage collection – can also be one of the consequences of population growth and increase the incidence of infectious diseases. Regarding respiratory diseases, the risk factors may be the alteration in air quality resulting from the atmospheric emission of polluting products during the construction of the factory, in addition to the generation of dust by the movement of the soil. In the case of sexually transmitted infections, there may be an increase in the number of diagnoses linked to the increase in houses of prostitution in the region, to meet the demand of the predominantly male itinerant population.

In addition to health, the demand for social assistance services also increases during the construction phase of the pulp mill. The increase in population, the rise in property prices, the increase in precarious housing and the worsening of the general living conditions of the population put pressure on social assistance services. The need to support vulnerable families, and the greater demand for social support programs are reflections of this dynamic. The pressure on urban infrastructure is another direct consequence of the population increase, which requires the expansion of water supply, garbage collection, electricity, telephony and internet services.

The installation phase may also result in increased pressure on essential services such as supermarkets and pharmacies due to the increased demand for consumer products and medicines. This pressure can lead to the scarcity of some products and the need to expand the service capacity of these establishments.

Also, the installation phase can also lead to changes in urban planning and road infrastructure. The need to handle large volumes of materials and the intense movement of heavy vehicles change the profile of transport in the region, increasing the risk of accidents and the deterioration of the roads. The construction of new roads and the improvement of existing ones are necessary to support the additional traffic, but they can also generate significant environmental impacts.

The environmental impacts of the installation phase include the removal of native vegetation, decrease in biodiversity, increase in erosion and siltation processes, production of solid waste and liquid effluents, and alteration of air, water and soil quality. Construction activities and the management of large vehicles, in addition to

the planting of eucalyptus, can generate a series of environmental consequences that need to be carefully managed to minimize the negative effects.

Finally, the installation of the factory brings significant challenges, especially due to the need for greater technical capacity of public servants to deal with the growing complexities of planning, execution and monitoring of public policies, in addition to the management of agreements, cash flows and data systems. The qualification of the Public Administration is a necessary response, not only to deal with the increase in tax collection, but also to efficiently manage these new resources. With more qualified civil servants, the municipality will be able to implement efficient strategic planning and effectively manage cash flows, agreements and data systems, in addition to accurately planning budget execution. This process will allow the municipality to maximize the benefits brought by private investment, reversing the gains in improvements in essential services and infrastructure, thus favoring the entire population.

In addition, the increase in the demands of the municipality requires a robust infrastructure for the integration of data management systems. The lack of qualified and integrated systems that encourage the adoption of adequate data and information management can hinder the effectiveness of decision-making, hinder the intersectionality of management, and reduce the ability to respond to the demands imposed by socioeconomic transformations. In this sense, the provision of governance mechanisms for data management is a necessary public initiative to ensure transparency and optimization of the execution of public services.

4.2.3 Operation Phase

As described earlier, the installation stage causes significant demographic changes, attracting temporary workers to the factory and other local businesses. In the operation phase, migration tends to be more permanent, with workers bringing their families and establishing residence in the municipality. 61 specific potential effects were mapped distributed over eleven general effects. Most of the impacts have already been addressed in the previous topics, as they are permanent or reproduce differently between phases.

In the labor market, the operation phase generates new direct and indirect jobs, although in smaller numbers than in the construction phase. Plant operation requires a significant number of professionals for operational, administrative, and general service roles. The creation of permanent jobs promotes the economic development of the region, but it also results in the demobilization of temporary workers, who may not find new opportunities and remain unemployed or underemployed.

During this phase of operations, the need for labor qualification continues to have a pressing effect, as the operation demands highly qualified professionals. These workers may not be available locally, leading to the importation of labor from other regions, but also indicating once again – the first was in the installation phase – the opportunity for public initiatives in training programs and partnerships with educational institutions that promote the training of local professionals, contributing to the development of talent in the region and improving the qualification of the local workforce.

The operation of the plant is a catalyst for economic growth, driving new business development and increasing per capita income. However, this economic dependence can make the region vulnerable to changes in the plant's operation, such as closures or production reductions, which could have significant impacts on the local economy.

The increase in tax collection is observed due to the increase in per capita income and the consumption of goods and services, keeping some taxes high during the operation. The presence of the pulp mill contributes significantly to the collection of municipal and state taxes, such as RETT, ISS, IPTU, ICMS and IPVA. The increase in economic activity and real estate appreciation raises the tax base, generating more revenue for the municipality. This allows for greater investments in infrastructure and public services, although it also depends on the ability of the public initiative to manage these resources efficiently and sustainably.

Public investments in the development of logistics infrastructure are once again propitiated, as the need to transport production and inputs puts pressure on the road network, demanding investments in infrastructure to ensure transport efficiency and avoid congestion and deterioration of the roads. The continuous

operation of the factory requires a robust logistics system for the movement of raw materials, finished products and workers. This includes the construction and maintenance of roads, bridges, and other transportation infrastructure.

The arrival of new residents continues to significantly alter the social dynamics of the region. The integration of new residents can be challenging, leading to cultural and social conflicts. In addition, disorderly growth can contribute to the increase in crime and violence, requiring greater investments in public security and social programs to mitigate these effects.

The creation and development of Research and Development (R&D) infrastructure is promoted by the operation of the factory, which can develop new technologies and train specialized labor through partnerships between government, business and universities. The presence of the factory, with its advanced technology and complex processes, can stimulate the creation, by the public initiative, of an innovative ecosystem in the region, improving regional competitiveness and training highly qualified professionals who meet the demands of the industrial sector.

The pressure on essential services continues to saturate the municipality's services, such as health, education and social assistance, intensified by the increase in the population of the family profile. The arrival of new residents and the growth of the local population increase the demand for health, education and social assistance services. The existing infrastructure may not be sufficient to meet these new demands, resulting in overloading of public services. Investments in new health facilities, schools, and social services are needed to ensure that the population has adequate access to these essential services.

The pressure on infrastructure and urban planning is manifested in the increase in traffic and the need to transport inputs and products, impacting road and housing infrastructure, raising housing costs and generating the possibility of slums, in addition to increasing the risks of accidents and the need for investments in improvements to highways and urban roads. Increased traffic and the need for constant transportation of materials can lead to deterioration of roads and an increase in maintenance costs. Additionally, the demand for housing can drive up property prices and rents, making it difficult for some families to find adequate and affordable housing, which can lead to the emergence of substandard housing and slums.

The environmental impacts of the operation include the increase in the production of solid waste and liquid effluents, the pressure on natural resources, the alteration of air, water and soil quality, the effect on wildlife and the loss of biodiversity due to the circulation of vehicles and the removal of native vegetation. Pulp production generates a significant amount of waste and effluents that need to be properly managed to avoid environmental contamination. The intensive use of natural resources such as water and energy can put pressure on the resources available in

the region. The factory's activities, including the transport of materials, can cause atmospheric emissions and alter the quality of the air, water and soil, in addition to negatively impacting the local fauna, increasing the risk of animals being run over and altering their natural habitats.

In short, the mapping of the potential effects arising from the installation of a pulp mill in a small municipality provides a detailed and comprehensive analysis of the social, economic and environmental impacts at each stage of the project. In addition to considering the direct effects generated by the factory's activities, this section also explored public initiatives that require strategic investments, such as the development of logistic infrastructure, the professional qualification of local labor, the creation of infrastructure for Research and Development (R&D), the technical training of public management, and the implementation of governance mechanisms for data management. These actions not only address many of the challenges posed by the socioeconomic changes arising from the installation of the factory, but also create the foundations for inclusive economic growth.

Section 5: Monitoring System

This section proposes a set of priority indicators, which were designed based on the effects presented in the Map of Potential Effects. Indicators play a crucial role as a management tool, offering objective data that guide decision-making and allow for the continuous monitoring of actions and results. By monitoring these indicators, it is possible to identify risks early on and take proactive measures to avoid larger problems, ensuring greater efficiency in resource allocation and service delivery.

The selection of indicators is divided into two main groups: risk indicators and revenue monitoring indicators. The group of risk indicators consists of 58 indicators, which monitor situations that require urgent actions, such as the overload of public equipment. These indicators were chosen for their relevance to the topic and their ability to capture changes over time. The collection monitoring group has 5 indicators, which signal possible effects on tax collection, reflecting the economic impact of the installation of the factory.

Most of the indicators come from public sources with recent data at the municipal level. However, some data may need to be collected and systematized by local secretariats. This initial list of indicators serves as a starting point for more comprehensive and adaptive monitoring as needs evolve and practice is observed. The complete list can be found in Annex II.

5.1 Effects and indicators

Risk indicators cover several areas crucial for the well-being of the population and the sustainability of growth. In the area of demographic change, the indicators monitor the variation of the population registered in the Single Registry in different age groups, reflecting the demand for public services such as basic education and social assistance. The importation of labor, monitored by the number of workers hired by the new enterprise and their families, requires agreements with the contracting company to keep this data updated and accurate.

The indicators of infrastructure and logistics development monitor the state's investment in security, per inhabitant; the average expenditure on health, education and urban infrastructure. These indicators are fundamental to evaluate the quality and efficiency of public services, reflecting the municipality's capacity to respond to the new demands that arise with population growth and industrial activity.

The pressure on infrastructure and urban planning is another crucial aspect, monitored by indicators such as the fleet of vehicles per 100 thousand inhabitants and the traffic mortality rate. This data helps to identify the need for investments in improvements and road safety, which are essential to support the increase in traffic generated by the plant's operation and population growth.

The social changes caused by the installation of the factory are monitored by indicators that record notifications of violence against women, the rate of intentional lethal violent crimes, robberies, vehicle thefts and drug seizures. In addition, the number of children and adolescents who are victims of sexual exploitation is also monitored, reflecting public safety and the effectiveness of social protection systems.

The pressure on essential services such as health, education and social assistance is monitored by a series of indicators. In the health area, indicators such as the population served by family health teams, the number of doctors and nurses per inhabitant, and the number of ICU beds are crucial to assess the capacity of the health system to respond to the new demand. In education, indicators that monitor the demand for places, educational quality, and investment per student are essential to ensure that the education system can adequately meet the increase in the student population. In social assistance, indicators of beneficiaries of the Continuous Cash Benefit (CCP) and the *Bolsa Família/Auxílio Brasil* Program help to monitor the socioeconomic vulnerability of the population.

Urban services also face increasing pressure and are monitored by indicators such as the population served with water supply, the sewage collection rate and the coverage of solid waste collection. These data reflect the quality and efficiency of essential urban services, which are crucial to maintain quality of life amid populational and industrial growth.

The increase in tax collection, monitored by economic indicators such as resources generated by the municipality, collection of IPTU, ISS, ICMS and RETT, is crucial to assess the fiscal sustainability and economic development of the region. These indicators help to understand how the economic activity of the pulp mill influences the generation of resources and the municipality's ability to invest in improvements for the community.

5.2 Use of indicators for monitoring impact

The application of these indicators in monitoring the impacts of the implementation of Suzano's pulp industrial plant in Ribas do Rio Pardo exemplifies how the data can be used to assess demographic changes, pressures on essential services, infrastructure and urban planning, social changes, and tax collection. Comparisons with other municipalities, such as Campo Grande, help to identify trends and formulate appropriate public policies. Continued monitoring and adaptation of indicators as needs evolve are essential for the informed and sustainable management of socioeconomic impacts.

Finally, the implementation of a robust and adaptable monitoring system will allow public managers and other stakeholders to closely monitor the effects of the pulp mill installation. This continuous monitoring is vital to ensure that public policies

and investments can be adjusted in order to maximize economic and social benefits, while minimizing negative impacts, thus promoting balanced and sustainable development for the territories of the Pulp Valley.

Final considerations

This report analyzed the economic and social effects of the installation of an industrial pulp mill in small municipalities, with a special look at the case of Ribas do Rio Pardo, as a microcosm of what can happen with similar projects along the so-called Pulp Valley. Although Mato Grosso do Sul has recorded significant economic growth, driven by agribusiness, this progress has not been proportionally reflected in social improvements, evidencing a disparity between economic growth and social inclusion.

Ribas do Rio Pardo exemplifies this disparity. The installation of the pulp mill brought investments and jobs, but also generated pressure on public services and infrastructure. These effects are not exclusive to Ribas do Rio Pardo and the case studies brought to this report show this phenomenon. In other cities, accelerated growth has also created challenges in managing demand for housing, health, education, public safety, and other essential services.

The mapping of the potential effects of the implementation of a pulp mill highlighted significant impacts in the three phases of the project, based on the effects highlighted in the literature and in the technical visit of IMDS. During the first phase, planning, real estate appreciation and the increase in economic expectations are pointed out. In the second phase, civil construction, there is an increase in the demand for labor, resulting in migratory flow and pressure on public services. In the last phase, of operation, the need for qualified labor and the permanence of socioeconomic impacts requires continuous management.

To assist in the management of these challenges, this report proposed a set of priority indicators for continuous monitoring, aiming at the prevention and mitigation of the main risks presented in the Map of Potential Effects and the minimization of pressures on essential public services. The participation of all stakeholders is crucial. An ongoing dialogue between public managers and local communities is essential to ensure that benefits are widely distributed.

Even with a short time passed since the start of operation of the Suzano mill, Ribas do Rio Pardo has already faced some of the effects, positive and negative, resulting from the evolution of the industrial planning and civil construction phases. Despite this, and as detailed in the Map, the municipality can still anticipate the effects of the third phase, minimizing the negative effects and maximizing its opportunities. In addition, the set of indicators may benefit other cities in Mato Grosso do Sul in the Pulp Valley that will receive large pulp and paper enterprises.

In conclusion, the installation of pulp projects in Mato Grosso do Sul presents opportunities and challenges. This report provides a solid basis for informed decisions, providing public managers with a deeper understanding of the inherent effects of the phenomenon studied. In addition to the direct impacts resulting from the implementation of the factory, the Map also identifies five actions that require

investments from the public sector: i) provision of training and professional qualification for the local population; ii) technical training of public management; iii) implementation of governance mechanisms for data management; iv) development of logistics infrastructure; and v) the creation and development of infrastructure for Research and Development (R&D).

Finally, we suggest, as a possibility of extending this work, the deepening of studies that support the formulation of policies to face some of the effects presented. As an initial step — which, however, requires a more detailed analysis for the construction of public policy proposals — we highlight three strategic fronts of action that can be designed and/or improved, implemented and coordinated by the State Government in collaboration with local governments, with the objective of dealing with the main impacts identified in section 4. The initial stage of this survey can be consulted in Annex III.

More specifically, among the five public initiatives that were flagged in the Map of Effects, we consider that three of them are promising responses to strengthen the capacity of municipalities to face the challenges imposed by the installation of a pulp and paper mill, or investments of similar size. The first of these, the offer of training and professional qualification for the local population, in addition to responding to the demands of the factory, contributes to the improvement of employability, wages and social inclusion of the local population. The other two initiatives concern the pressures faced by Public Administration: the technical training of public management and the implementation of governance mechanisms for data management. These, in turn, are absolutely essential to face the challenges posed by increased tax collection, and the need to manage agreements, cash flows, and data systems more effectively. All the more so if the government proposes, as is the case, a municipalistic approach (defined as a strategy for institutional reinforcement of municipalities as a locus for the allocation of fiscal resources, given the proximity that local management has to the citizen client of public policy).

The first strategic front is related to the shortage of qualified labor and in sufficient quantity to meet the different phases of implementation of the project. This challenge requires integrated policies for professional training and technical and technological education. Among the main actions, we could highlight the implementation of public policies for professional training, with a focus on technical and vocational programs aligned with the demands of the pulp industry; the strengthening of integration between the different levels of education and the productive sector, encouraging internships, training and learning programs; the creation or promotion for the creation of centers of excellence in technical training; and the development of digital platforms that connect workers and job opportunities, facilitating access to qualification courses. In addition, it is essential to strengthen partnerships with private institutions, such as Sistema S, and coordinate these initiatives with municipal governments to maximize results. Also,

a solution to respond to the short interval between the leave and the start of operations is to strengthen the partnership between the State Government and the municipality to anticipate professional qualification policies, focused on the transition of the profile of local workers, and intersectoral policies to attract specialized workers from other regions. It should be noted that here too the solution posed to respond to the specific challenges of the pulp and paper industry is generalizable to the other sectors of the economy.

A well-designed labor training policy depends on the identification of local production chains and comparative advantages of the state, definition of training curricula prepared in partnerships with the main labor demanders in each region, and, not least, with strategies for the selection of candidates for courses with an adequate profile, so that they have enough tools at least not to evade throughout the training. This is not trivial. It is very common to mismatch the offer of courses and the public that ends up registering for the programs. A labor intermediation system that contains the offer of professional training combined with efficient labor screening mechanisms requires a wealth of information that does not exist today in the National Employment System.

The second front concerns the technical training of public management. The installation of a large industrial complex increases tax collection, expanding municipal investment capacity and the need to qualify municipal and state technical teams in three priority areas: management of bidding processes, fiscal and financial management, and strengthening of municipal governance. It is essential that the municipal public administration receives adequate technical support to manage the demands arising from large investments. This includes, above all, the training of local teams, with a focus on practical skills to deal with increased revenues and more complex fiscal and financial management. It is essential that public management is prepared to ensure the efficient application of resources and the implementation of public policies that directly benefit the community. In a practical way, the training should i) cover all stages of the bidding process, from the planning of acquisitions to the issuance of legal opinions and constant updating in relation to the rules of the Courts of Auditors; ii) train civil servants to rigorously plan and execute the budget and manage cash flow and iii) strengthen municipal governance, focusing on intersectoral organization to respond to immediate demands while promoting medium and long-term planning.

The experience of states such as Ceará and Espírito Santo is cited as an inspiring model, highlighting their policies of continuous training for public servants. The School of Government of Mato Grosso do Sul, through programs such as "Rota do Conhecimento" seeks to prepare civil servants for more efficient public management. The use of the school of government as a tool for the training of municipal managers is a path that can bear fruit. Also, a consortium mechanism between the state and municipalities for the temporary assignment of qualified civil

servants from the former to the latter, explaining processes that usually occur informally, is another mechanism that would reinforce and give feedback on the effectiveness of the school of government in the training of staff.

Finally, the third strategic front is related to governance and data management in Mato Grosso do Sul. Integrated data management is essential to support decisions in all phases of public policies - planning, execution and monitoring - especially in municipalities facing rapid economic and social transformations. In Mato Grosso do Sul, the GOV MS Intelligence Center and the MS Ativo initiative work to strengthen governance and promote evidence-driven public management. The integration of these efforts aims to optimize the use of resources, ensure transparency, and align policies with social and economic demands, preparing the state for economic development that is in line with the social progress of the local community. It is essential that municipal employees are properly supported with technical support for the implementation of local data management systems. By ensuring real-time data collection and analysis, municipalities will be better able to make evidence-based decisions, plan strategic actions, and monitor the results of their policies on an ongoing basis. In this way, capacity building and support for municipalities not only contribute to overcoming current challenges, but also create a solid foundation for inclusive development in the long term.

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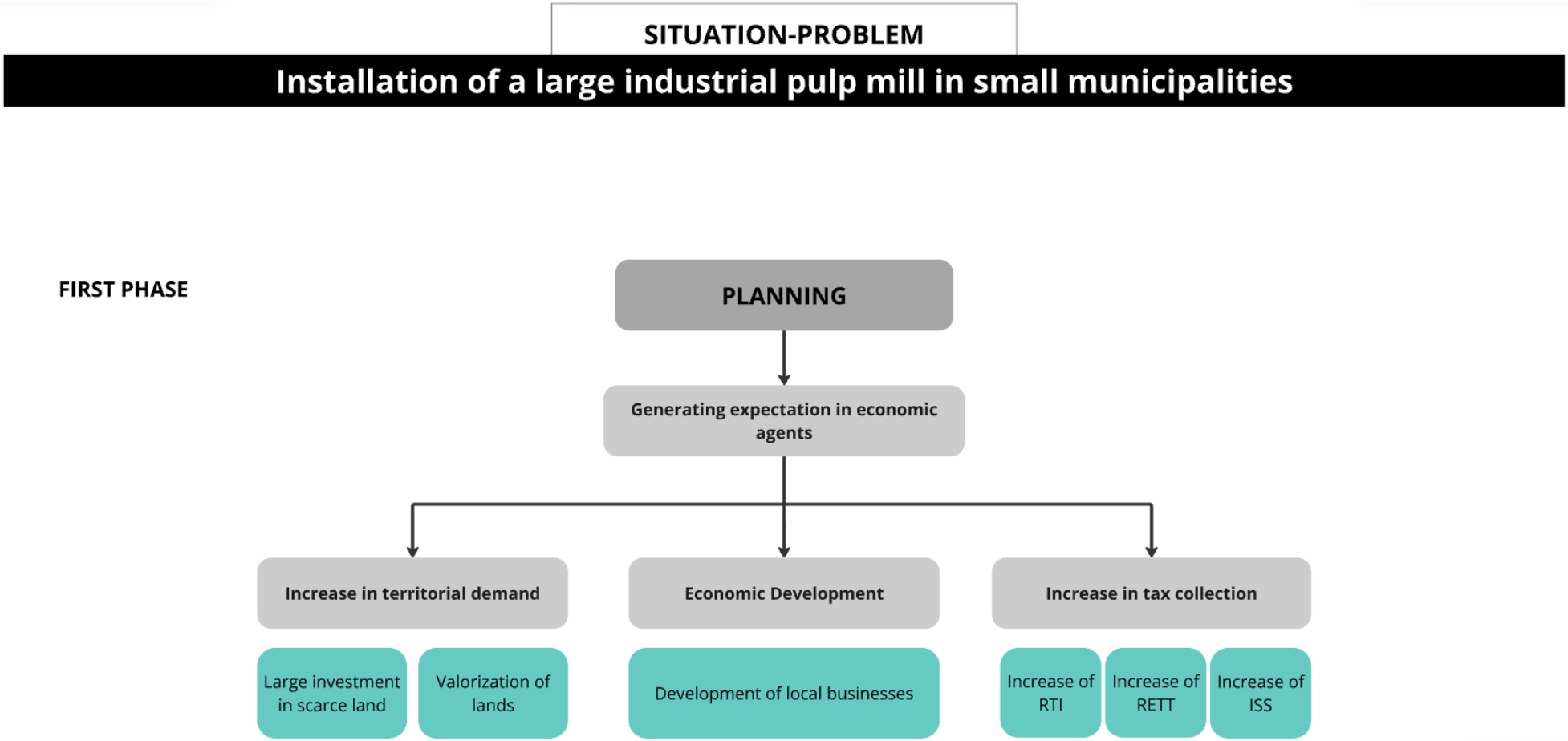
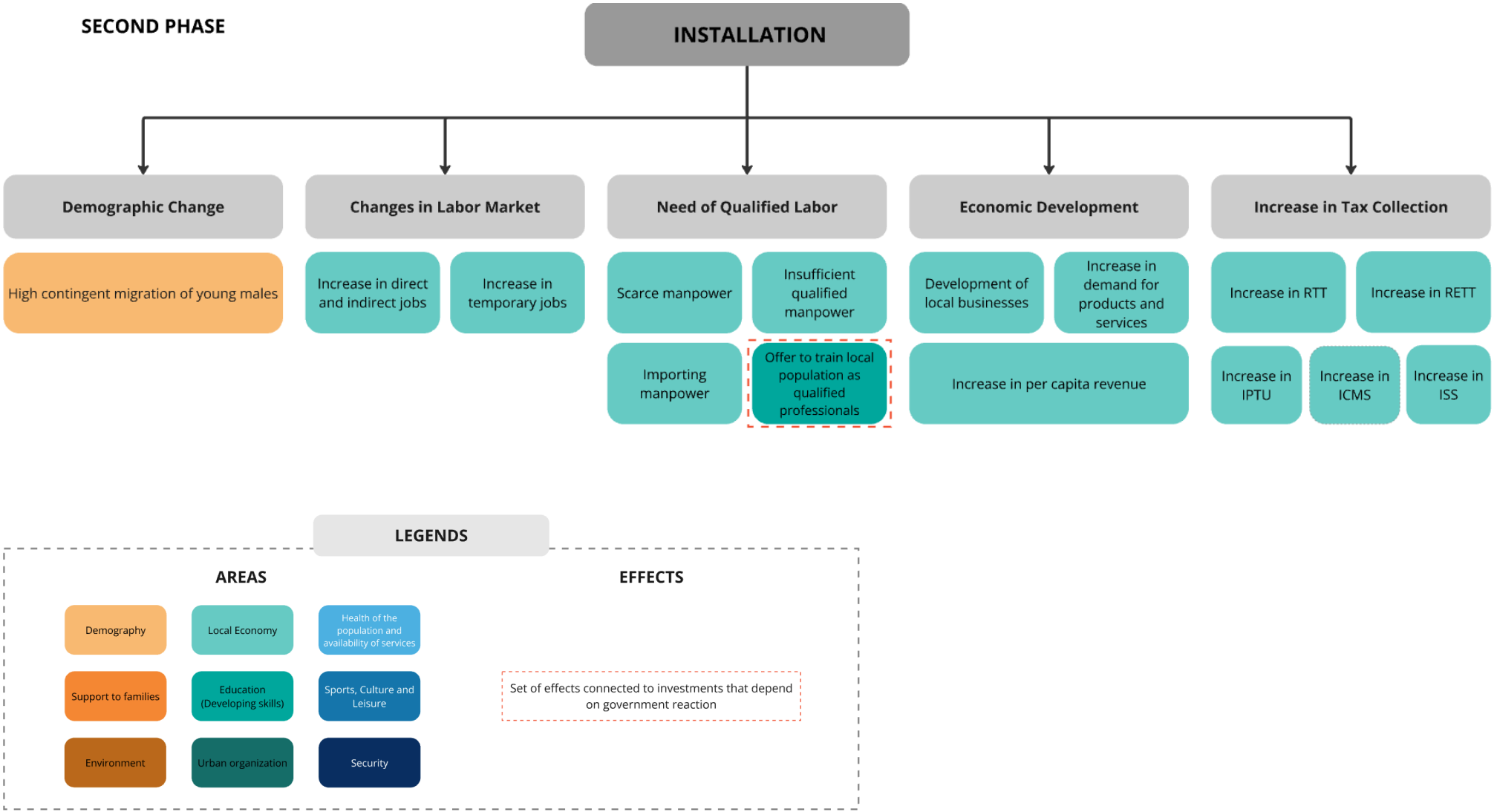
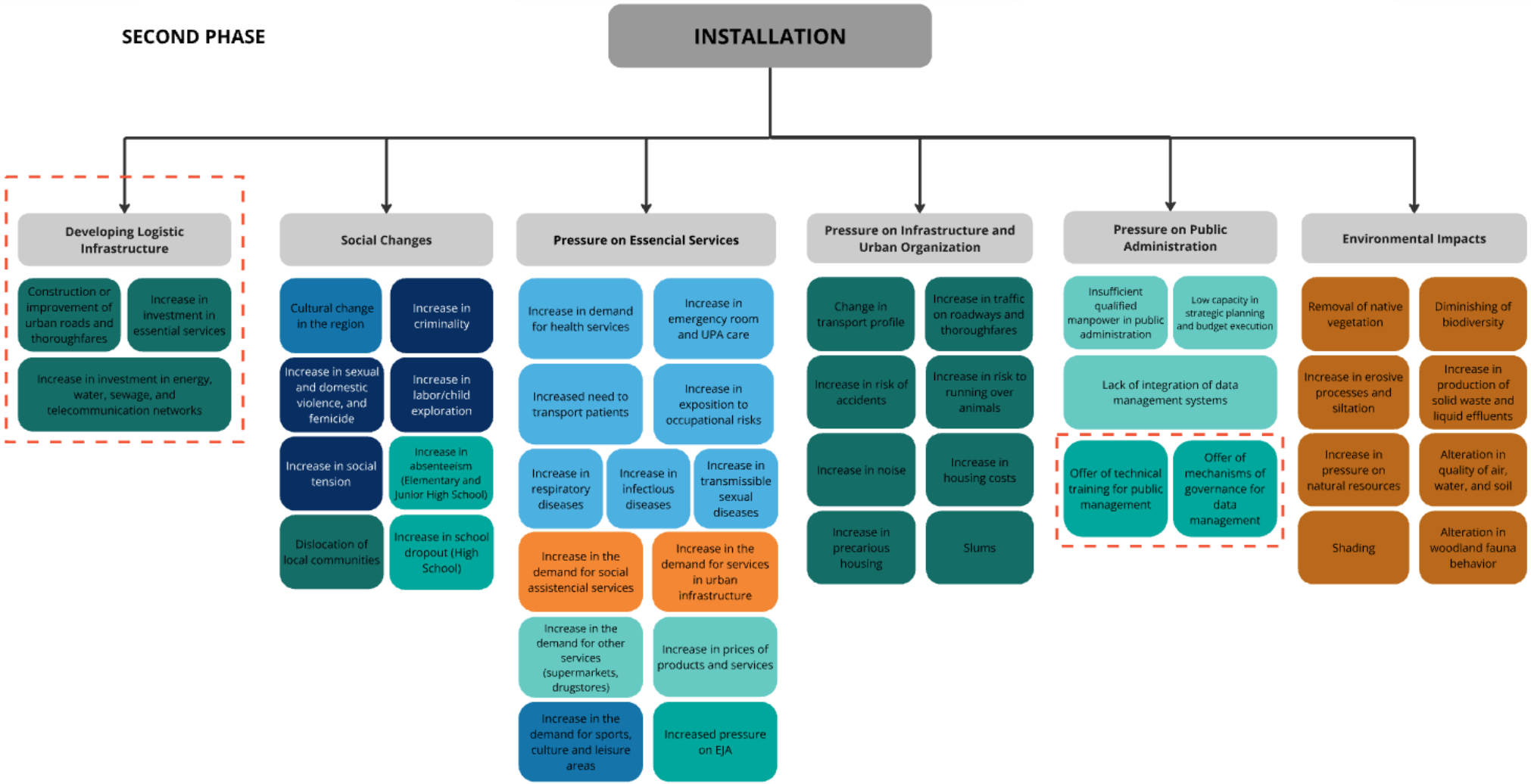
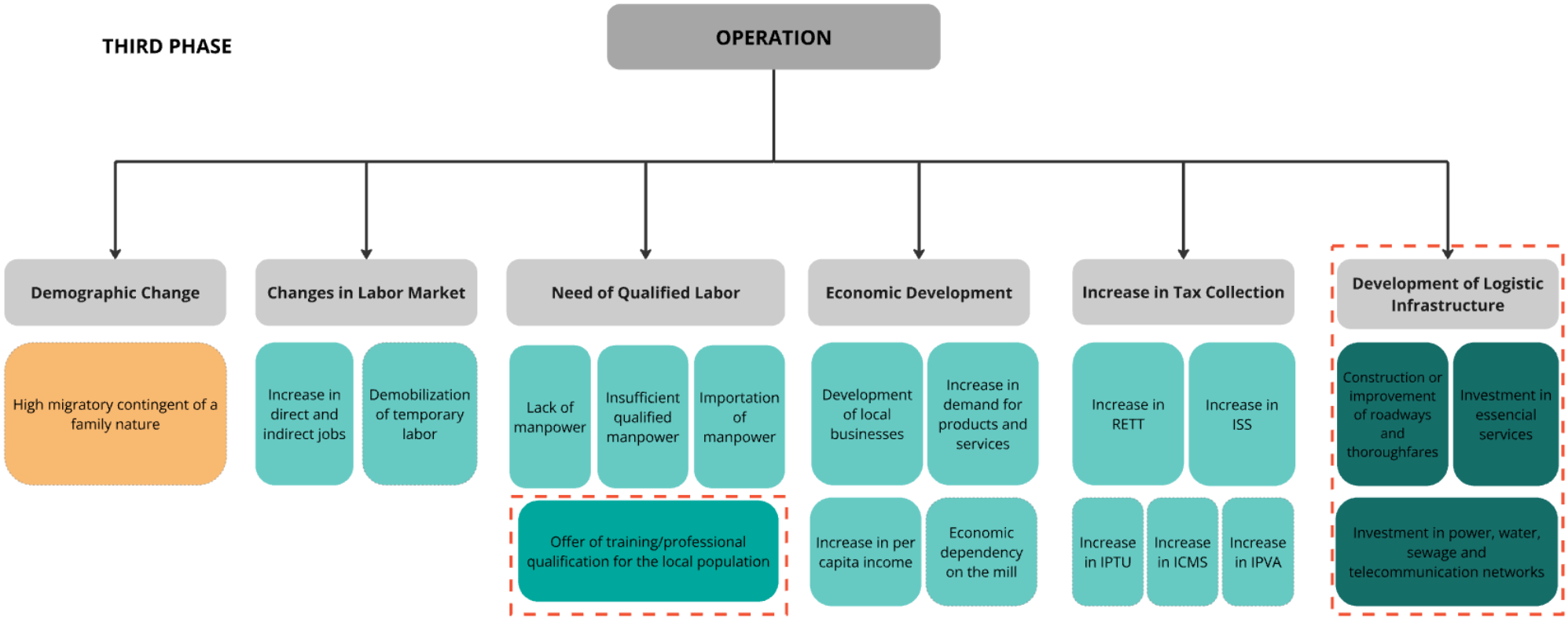
Annex I: Map of Potential Effects

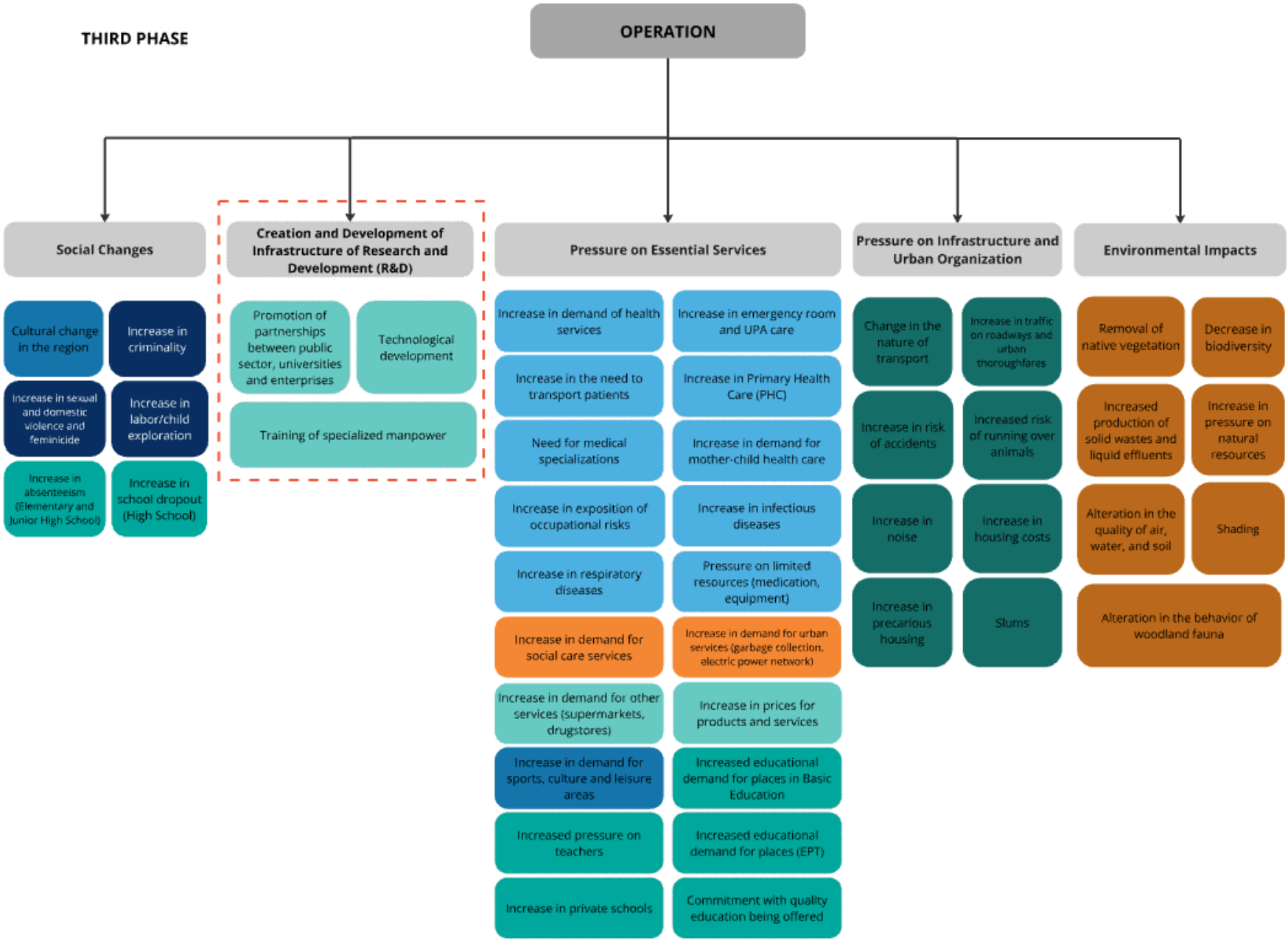



SECOND PHASE
INSTALLATION
Demographic Change
Changes in Labor Market
Need of Qualified Labor
Economic Development
Increase in Tax Collection
High contingent migration of young males
Increase in direct and indirect jobs
Increase in temporary jobs
Scarce manpower
Insufficient qualified manpower
Importing manpower
Offer to train local population as qualified professionals
Development of local businesses
Increase in demand for products and services
Increase in per capita revenue
Increase in RTT
Increase in RETT
Increase in IPTU
Increase in ICMS
Increase in ISS
LEGENDS
AREAS
Demography
Local Economy
Health of the population and availability of services
Support to families
Education (Developing skills)
Sports, Culture and Leisure
Environment
Urban organization
Security
EFFECTS
Set of effects connected to investments that depend on government reaction


SECOND PHASE
INSTALLATION
Developing Logistic Infrastructure
Construction or improvement of urban roads and thoroughfares
Increase in investment in essential services
Increase in investment in energy, water, sewage, and telecommunication networks
Social Changes
Cultural change in the region
Increase in criminality
Increase in sexual and domestic violence, and femicide
Increase in labor/child exploration
Increase in social tension
Increase in absenteeism (Elementary and Junior High School)
Dislocation of local communities
Increase in school dropout (High School)
Pressure on Essencial Services
Increase in demand for health services
Increase in emergency room and UPA care
Increased need to transport patients
Increase in exposition to occupational risks
Increase in respiratory diseases
Increase in infectious diseases
Increase in transmissible sexual diseases
Increase in the demand for social assistencial services
Increase in the demand for services in urban infrastructure
Increase in the demand for other services (supermarkets, drugstores)
Increase in prices of products and services
Increase in the demand for sports, culture and leisure areas
Increased pressure on EJA
Pressure on Infrastructure and Urban Organization
Change in transport profile
Increase in traffic on roadways and thoroughfares
Increase in risk of accidents
Increase in risk to running over animals
Increase in noise
Increase in housing costs
Increase in precarious housing
Slums
Pressure on Public Administration
Insufficient qualified manpower in public administration
Low capacity in strategic planning and budget execution
Lack of integration of data management systems
Offer of technical training for public management
Offer of mechanisms of governance for data management
Environmental Impacts
Removal of native vegetation
Diminishing of biodiversity
Increase in erosive processes and siltation
Increase in production of solid waste and liquid effluents
Increase in pressure on natural resources
Alteration in quality of air, water, and soil
Shading
Alteration in woodland fauna behavior

THIRD PHASE


OPERATION
Demographic Change
High migratory contingent of a family nature
Changes in Labor Market
Increase in direct and indirect jobs
Demobilization of temporary labor
Need of Qualified Labor
Lack of manpower
Insufficient qualified manpower
Importation of manpower
Offer of training/professional qualification for the local population
Economic Development
Development of local businesses
Increase in demand for products and services
Increase in per capita income
Economic dependency on the mill
Increase in Tax Collection
Increase in RETT
Increase in ISS
Increase in IPTU
Increase in ICMS
Increase in IPVA
Development of Logistic Infrastructure
Construction or improvement of roadways and thoroughfares
Investment in essencial services
Investment in power, water, sewage and telecommunication networks


THIRD PHASE
OPERATION
Social Changes
Creation and Development of Infrastructure of Research and Development (R&D)
Pressure on Essential Services
Pressure on Infrastructure and Urban Organization
Environmental Impacts
Cultural change in the region
Increase in criminality
Increase in sexual and domestic violence and feminicide
Increase in labor/child exploration
Increase in absenteeism (Elementary and Junior High School)
Increase in school dropout (High School)
Promotion of partnerships between public sector, universities and enterprises
Technological development
Training of specialized manpower
Increase in demand of health services
Increase in emergency room and UPA care
Increase in the need to transport patients
Increase in Primary Health Care (PHC)
Need for medical specializations
Increase in demand for mother-child health care
Increase in exposition of occupational risks
Increase in infectious diseases
Increase in respiratory diseases
Pressure on limited resources (medication, equipment)
Increase in demand for social care services
Increase in demand for urban services (garbage collection, electric power network)
Increase in demand for other services (supermarkets, drugstores)
Increase in prices for products and services
Increase in demand for sports, culture and leisure areas
Increased educational demand for places in Basic Education
Increased pressure on teachers
Increased educational demand for places (EPT)
Increase in private schools
Commitment with quality education being offered
Change in the nature of transport
Increase in traffic on roadways and urban thoroughfares
Increase in risk of accidents
Increased risk of running over animals
Increase in noise
Increase in housing costs
Increase in precarious housing
Slums
Removal of native vegetation
Decrease in biodiversity
Increased production of solid wastes and liquid effluents
Increase in pressure on natural resources
Alteration in the quality of air, water, and soil
Shading
Alteration in the behavior of woodland fauna

Annex II: Monitoring system indicators

Table 1 - Risk Monitoring Indicators

General effects	*Specific effects*	*Indicators*
Demographic change	High contingent of migration of a family profile	Registered in *CadÚnico* - 0 to 3 years old
		Registered in *CadÚnico* - 4 to 5 years old
		Registered in *CadÚnico* - 6 to 10 years old
		Registered in *CadÚnico* - 11 to 14 years old
		Registered in *CadÚnico* - 15 to 17 years old
		Registered in *CadÚnico* - 18 to 24 years old
		Registered in *CadÚnico* - 25 to 64 years old
		Registered in *CadÚnico* - Over 65 years old
	Labor Import	Number of workers expected including outsourced workers and families
Infrastructure and logistics development	Investment in essential services	State investment in the municipality with security per inhabitant ($)
		Average spending on health per inhabitant (R$)
		Average expenditure on education per inhabitant (R$)
		Average expenditure on urban infrastructure (R$)
Pressure on infrastructure and urban planning	Increased traffic on public roads	Fleet of vehicles (per 100 thousand inhabitants)
		Traffic death (evolution)
	Pressure on water supply, sanitation and garbage collection	Population served with water supply (%)
		Sewage collection index (%)
		Solid waste collection coverage (%)
Social changes	Increase in domestic violence, sexual violence and femicide	Notifications of violence against women (per 100 thousand women)
	Increase in crime	Intentional lethal violent crime (ILVC) rate per 100,000 inhabitants
		Robberies per 100 thousand inhabitants
		Vehicle theft per 100 thousand inhabitants
		Robbery of vehicles per 100 thousand inhabitants
		Male juvenile homicide rate
		Drug seizures (separated by cocaine, marijuana and other drugs) - 3-year moving average
	Child exploitation	Children and adolescents' victims of sexual exploitation (per 100 thousand children aged 0 to 17 years)

(continues)

(Table 1 continuation - Risk Monitoring Indicators)

General effects	***Specific effects***	***Indicators***
Pressure on essential services – EDUCATION	Increased educational demand for vacancies	Difference between Number of children aged 0-3 years in *CadÚnico* (Demand) and Number of Enrollments in public daycare centers
		Difference between Number of children aged 4-5 years in *CadÚnico* (Demand) and Number of Enrollments in public preschool
		Difference between Number of children aged 6-10 years in *CadÚnico* (Demand) and Number of Enrollments in public elementary school
		Difference between Number of children aged 11-14 years in *CadÚnico* (Demand) and Number of Enrollments in public junior high school
		Ratio between Enrollment in elementary school and Active teachers (not on leave) at the same stage
		Ratio between Enrollment in junior high school and Active teachers (not on leave) at the same stage
		Ratio between the variation of Enrollments in regular secondary education and EJA and the variation of workers with complete elementary and junior high school education and without complete secondary education (company data)
	Commitment to the educational quality offered	Failure Rate in the 3rd grade - Elementary School (failure rate + abandonment rate)
		Failure Rate in the 6th Grade – Junior High School (failure rate + abandonment rate)
		IDEB Final Years - public school
		IDEB Early Years - public school
		CAED – Junior High School - public school network
		High School teachers in group 5 of teaching effort (%)
		Elementary School teachers in group 5 of teaching effort (%)
		Junior High School teachers in group 5 of teaching effort (%)
Pressure on essential services – HEALTH	Increased demand for Healthcare Services	Population assisted by family health teams (%)
		Emergency care (per 100 thousand inhabitants)
		Hospitalizations for ambulatory care-sensitive conditions (per 100,000 inhabitants)
		Physicians (standardized by workload, per 1,000 inhabitants)
		Nurses (standardized by workload, per 1,000 inhabitants)
		SUS ICU beds (per 100 thousand inhabitants)

(continues)

(Table 1 continuation - Risk Monitoring Indicators)

General effects	***Specific effects***	***Indicators***
(cont.) Pressure on essential services – HEALTH	Increased demand for maternal and child health services	Pregnant women with insufficient prenatal coverage (%)
		Low birth weight (%)
	Increase in infectious diseases	Hospitalizations due to diseases related to inadequate environmental sanitation (per 100 thousand inhabitants)
	Pressure on emergency services	Rate of hospitalizations for alcohol-related disorders (per 100 thousand inhabitants)
		Rate of hospitalizations for disorders related to psychoactive substances (per 100 thousand inhabitants)
Pressure on essential services – SOCIAL ASSISTANCE	Increased demand for social assistance services	New families included in the PAIF monitoring/ New families included in *CadÚnico*
		Beneficiaries of the Continuous Cash Benefit - CCB (%)
		Beneficiaries of the *Bolsa Família/Auxílio Brasil* Program (%)
Pressure on essential services – URBAN SERVICES	Increasing demand for urban services	Population served with water supply (%)
		Sewage collection index (%)
		Solid waste collection coverage (%)

Table 2 - Indicators for monitoring Revenue		
General effects	***Specific effects***	***Indicators***
Increased tax collection	Increase in IPTU, ISS, ICMS and RETT	Resources generated by the municipality/total revenue
		Urban Property Tax - IPTU (R$)
		Service Tax - ISS (R$)
		Current transfers - ICMS share (R$)
		RETT - Real Estate Transfer Tax (R$)

Annex III: Strategic action fronts

This Annex presents three fronts of strategic action to adequately respond to the process of economic growth and increased economic and social complexity. Very often – in fact – the historiography of similar processes has revealed that the State has not been able to respond satisfactorily to the process of economic growth both in its capacity for investments in infrastructure that allow gains in general productivity, nor has it been able to properly increase the stock of human capital in order to allow better distribution resulting from the increase in wealth generation. In this sense, it is essential to provide the local public sector with the capacity to respond to the increase in social demands that meet these two imperatives.

It is necessary, therefore, that the local public sector, in interaction with state-level policies, be able to qualify the workforce for the nascent industry and implement public policies focused on actions aimed at distributing the fruits of economic growth in a way that does not raise levels of poverty and vulnerability.

1. Labor qualification strategies for the pulp industry in the state of Mato Grosso do Sul

Industrial development in the state of Mato Grosso do Sul, particularly in the pulp sector, has proven to be a significant driving force for regional economic growth. The installation of pulp mills in small and medium-sized municipalities brings with it economic benefits, but also substantial challenges, especially with regard to the social conditions of the most vulnerable part of the population and the qualification of the workforce. The need for trained professionals in sufficient quantity is imperative for the success of the various phases of implementation and operation of these industrial units.

In this context, public policies play a crucial role as inducers of programs and projects, both public and private, that aim to meet the demands for qualified labor. Coordinated action between different spheres of government and the private sector is essential for the creation of a favorable environment for the development of specific technical skills, adapted to the requirements of the pulp industry.

Public policies are responsible for fostering the creation of professional training programs that meet the needs of the labor market, ensuring that the local workforce is prepared to face the technological and operational challenges inherent to the pulp industry. This includes everything from offering technical and vocational courses to implementing partnerships with educational institutions and companies in the sector, aiming at the development of curricula aligned with market demands.

In addition, government initiatives should promote integration between different levels of education and industry, encouraging internships, training, and learning programs that provide practical experiences for future professionals. The creation of centers of excellence in professional training, with a focus on the pulp industry, can serve as a pillar for the continuous training and technological updating of workers.

This annex addresses, in detail, the pressing need for labor qualification for the pulp industry in Mato Grosso do Sul. We explore how public policies can and should act as catalysts in the implementation of programs and projects that meet labor needs in the various phases of pulp mill implementation. We also highlight examples of successful initiatives and discuss strategies for the sustainable and inclusive development of the workforce, aligning economic growth and social progress.

As detailed in section 3, which characterizes the pulp industry, each of the three phases of implementation has distinct and specific labor requirements, as well as different commissioning times for workers. In addition to direct jobs, the economic development of the city and the surrounding region where the pulp industrial complex is installed is strongly impacted, generating a significant increase in the supply of indirect jobs, especially in the trade and services sectors.

During the construction phase of the factory, which lasts from eighteen to twenty-four months, approximately 10 thousand workers are needed at the peak of the construction works. The specializations required are predominantly in the areas of civil construction, transportation, occupational safety, food services and general services. This phase demands an intense and diverse workforce, capable of meeting the complex needs of a large engineering work.

In the operation phase, the direct jobs, which total about 1,500 in the mill and another 1,500 in the management of eucalyptus forests, require different qualifications and deadlines. The profile of workers at this stage is more technical and specialized, with specific skills for the operation and maintenance of high-tech industrial and forestry equipment. Due to the long-term permanence, the tendency is for these workers to establish residence in the city together with their families, contributing to the demographic and economic growth of the region.

Through structured interviews conducted with executive leaders and a detailed study of its strategic planning, we identified that the Government of the State of Mato Grosso do Sul established in its Multi-Year Plan (PPA), as explained in its strategic guidelines, the commitment to the "expansion of the labor market, through the increase of schooling and the provision of qualification opportunities, training and inclusion in this market, providing the improvement of people's income". To fulfill this commitment, the current government has designated a structure and budget to address the challenges of the shortage of qualified human resources to meet the growing demand for skilled labor in the state.

The Executive Secretariat for Professional Qualification and Labor, linked to the State Secretariat for the Environment, Development, Science, Technology and Innovation (SEMADESC), is responsible for the implementation and articulation of professional qualification policies in the State and for coordinating with the productive sector to better understand their immediate and future needs to fill jobs. In addition to this articulation with the productive sector, the Secretariat of Professional Qualification and Labor, together with the Worker's Foundation of Mato Grosso do Sul (FUNTRAB MS), plans and executes training and professional qualification offers throughout the state. These offers can be made directly by the

Secretariat and FUNTRAB or in partnership with the private sector, especially the S System, which is linked to industry, agriculture, commerce and Sebrae, in addition to private entities contracted through public notice.

The entire offer of training or professional qualification courses is based on diagnoses carried out in each municipality of the State, where economic vocations are identified, and vacancy offers, and training needs are mapped. This information is updated monthly by FUNTRAB through the Labor Market Bulletin on the foundation's website. MS Qualifica is the main initiative of the State Government of Mato Grosso do Sul for the qualification of unemployed workers who are looking for a replacement in the labor market. Currently, the state has one of the lowest unemployment rates in Brazil, with approximately 4.4%, which represents, in absolute numbers, approximately 66 thousand people in this situation, according to information from FUNTRAB. The Executive Secretariat for Professional Qualification and Labor is designing a new digital platform for labor intermediation to accelerate the employability process of these workers, with the expectation of increasing the number of job vacancies. On this platform, it will be possible for companies to place their vacancies without paying for this service, reducing the costs of the hiring process and allowing the worker to identify job opportunities and also qualification courses, all in a fast, up-to-date and online way.

Another structure of the executive branch focused on training and qualification with the objective of increasing employability is the State Department of Education, which offers Technical Professional Education (EPT) in the modalities: Integrated to High School, in a specific Training Itinerary, or Subsequent to the end of High School. Like the Executive Secretariat for Professional Qualification and Work, the State Department of Education, through the Coordination of Professional Education, carries out diagnoses of the economic vocations of each municipality in the State using a methodology known as the Offer Definition Guide, and thus defines the menu of courses and Training Itineraries of Technical Professional Education to be offered in the schools of the State Education Network of Mato Grosso do Sul.

Currently, 77 of the 79 municipalities are contemplated with at least one Technical Professional Education class, in various training itineraries in the areas of logistics, agriculture, accommodation, data sciences and forestry, among others. This last itinerary, demanded by the Secretariat of Professional Qualification and Labor, aims to favor the subsequent allocation in the market that offers a high supply of vacancies in the forestry sector in the Pulp Valley. Currently, this training itinerary in forestry is offered in some schools of the State Network in the municipality of Três Lagoas and, in 2025, it will be expanded to Ribas do Rio Pardo and Inocência, with the aim of meeting the future demand for technical level professionals in this specialty.

In the experience of municipal policies for professional qualification, the city of Ribas do Rio Pardo offers significant learnings, of which three are highlighted below:

1. Nomadic workers in large civil engineering works: it was identified in the interviews carried out with the executives of City Hall and also of the State

Government that a large part of the workers in the civil construction phase, such as those at the Suzano factory, are nomads attracted by job opportunities. These professionals, from different regions of the country, are hired by large contractors and bring specialized skills in heavy construction, assembly of metal structures, installation of industrial equipment and finishing of complex works. The contribution of nomadic workers is crucial, as they are responsible for performing tasks from the foundation of the structures to the installation of the production systems, making up for the lack of local labor with these specific qualifications, ensuring the fulfillment of the project's delivery deadlines.

2. Economic boost and need for qualification: The construction of the factory, in addition to generating direct jobs, also boosts the economy of the city and the surrounding region, creating a ripple effect of economic development. This effect increases the demand of commerce for products and services, generating an immediate need for professional qualification and incentive to entrepreneurship. In Ribas do Rio Pardo, the Municipal Secretariat of Entrepreneurship was created to plan and execute policies, programs and projects to promote entrepreneurship and job creation, taking advantage of the benefits generated by the installation of the factory. Partnerships with entities such as SEBRAE, Sistema S and the Federation of Industries of Mato Grosso do Sul (FIEMS) were fundamental for City Hall, despite numerous difficulties, to face the challenges so as to meet the high demand. An example is the integrated education center, the result of a partnership between City Hall and FIEMS, which will serve more than 2.1 thousand students, from basic education to vocational education, meeting the future demand for qualified labor.

3. Challenges in changing the profile of the workforce: In cities with a predominantly agricultural economic vocation, transforming the profile of workers in the short term is a challenging task, especially for a municipality and a region with low population density. The interval between the license and the start of operations is short, making it difficult for the local workforce to adapt to the new requirements in a timely manner. A productive solution is to strengthen the partnership between the State Government and City Hall to anticipate professional qualification policies, focused on the transition of the profile of local workers, and intersectoral policies to attract specialized workers from other regions, offering adequate urban and housing infrastructure to receive them.

Clear, coherent and consistent logic can be observed in the current policy of qualification and technical-professional education of the Government of the State of Mato Grosso do Sul. This structure begins with a well-designed strategic plan, which unfolds into specific legislation, ensuring both the necessary infrastructure and budget. In addition, the execution of programs and projects aims to ensure not only opportunities, but also the appropriate conditions for citizens to be fully able to access the available job vacancies. However, for entrepreneurs to continue investing in the state, it will be necessary to accelerate and increase the level of qualification of the local workforce and to think about a structured policy to attract labor soon, if the levels of investment in the pulp and paper area remain at the current levels.

2. Technical training of public management

The State of Mato Grosso do Sul, with its vast territorial extension and growing economy, has stood out as an important investment hub, especially in agribusiness, energy and, more recently, in the pulp industry. Small and medium-sized municipalities, which historically had rudimentary administrative structures - and focused on local demands, now face the challenge of meeting a new reality. The arrival of large enterprises, such as a pulp mill, profoundly transforms the economic and social fabric of these cities, bringing with it a significant increase in population as a result of the flow of workers both during the construction phase and in the operation of industrial plants.

Given this scenario, it is imperative to qualify municipal technical teams and state employees. The public machine, responsible for ensuring the supply of essential services to the population, needs to be prepared to deal with the new demands and pressures imposed by the rapid population growth and the complexity of ongoing projects. Efficiency in public management therefore involves the continuous training of civil servants, which requires a solid and dedicated structure to meet this need.

The training tracks for public servants cover a wide range of critical topics for public management in states and municipalities. In the context of the municipalities of the Pulp Valley, which face significant pressures due to rapid population and economic growth, it is essential to prioritize three strategic areas of capacity building:

1. Management of bidding processes: Training in this area should go beyond basic knowledge about public bidding, covering the entire life cycle of the bidding process. This includes the planning of the acquisition of goods and services, the preparation of technical justifications, the survey of prices, the issuance of legal opinions and the continuous updating of the resolutions and determinations of the State Court of Accounts and complementarily of the TCU. Qualification in the management of bidding processes is essential to ensure transparency, agility, efficiency, and legal compliance in public procurement, especially in an accelerated growth environment.

2. Fiscal, budgetary, and financial management: In a scenario of intense growth in revenue and increased demand for public services, training in fiscal and financial management is crucial. Civil servants need to be trained to carry out rigorous budget planning, including detailed monitoring of cash flow and offering training so that municipal treasury technicians are able to access credit operations that can be raised from development institutions such as BNDES, Caixa Econômica and Banco do Brasil, increasing the municipality's investment capacity. This is essential to ensure that public resources are used efficiently, meeting emerging needs without compromising long-term fiscal sustainability.

3. Strengthening municipal governance: The articulation of integrated planning is vital to face the challenges brought about by the large influx of immigrant workers. Training should focus on intersectoral organization to respond to immediate demands, while promoting medium and long-term planning. The objective is to

ensure that the economic benefits generated by the installation of large enterprises, such as a pulp mill, contribute to the reduction of social inequalities and the sustainable development of the municipality.

In Brazil, some states have developed sophisticated policies aimed at developing and strengthening the technical, strategic, and psychological skills of their civil servants, with the aim of increasing the efficiency of public administration, making it more effective in planning and achieving the desired impacts. In these states, it is evident that institutional strengthening, through the improvement of the staff of civil servants, generates even more positive results when the municipalities also assume this commitment in their administrations.

The State of Ceará, nationally recognized for its good results in basic education both in the state and municipal networks, exemplifies an inspiring model of cooperation in the formation of municipal technical teams. Ceará has specific legislation that establishes a collaboration regime in which the State, through the Institute for Research and Economic Strategy of Ceará (IPECE), offers training and support to municipal employees in the preparation of strategic plans, policies and programs in various sectors, whenever requested. In addition, IPECE assists in the design and execution of impact assessments of policies and programs implemented by municipalities, with a focus on continuous improvement and correction of the course of initiatives, as necessary.

Also in Ceará, the School of Public Management of the State of Ceará (EGPECE) is a strategic institution for the development of the state and municipalities. EGPCE, part of a network of Government Schools, is responsible for the formulation and execution of the policy for the training and continuing education of public servants, both state and municipal.

Another state that stands out as a source of inspiration in the formulation and execution of policies and programs for the development and constant training of technical staff of the state and municipal public service, in addition to offering training for organized civil society, is Espírito Santo. The traditional School of Public Service of Espírito Santo (Esesp), in existance since 1975, has been continuously renewed in search of educational solutions for the development of professional and personal skills necessary for state and municipal institutions and organized civil society, for the benefit of the citizens of the state.

It is important to highlight that Espírito Santo was one of the pioneer states in the pulp industry in Brazil and continues to have significant relevance both nationally and internationally. A more careful analysis of this state, especially of the economic and social indicators of the municipality of Aracruz, where Suzano's industrial plant is located, can be a valuable exercise to identify the skills needed by municipal employees after decades of operation of the plant.

In this context, the School of Government Foundation of the State of Mato Grosso do Sul stands out as a crucial actor. With the mission of training and qualifying public servants, the School of Government, in its current structure, has the potential to transform the administrative scenario of the state. In addition to expanding the

training of state employees, the School of Government is committed, in a collaborative regime, to also meet the general and specific demands of municipal employees, especially to face the challenges imposed by large investments, such as those made in the municipalities of Vale da Celulose.

According to the strategic planning of the State of Mato Grosso do Sul, the School of Government, an autarchy linked to the Secretariat of Administration, is responsible for offering courses, training and development programs that not only prepare civil servants for immediate challenges, but also enable them for more effective and resilient public management in the long term.

Attentive to the regional development movements of the State and with the objective of meeting the demands of training of municipal employees, the School of Government is preparing the "Knowledge Route" program to offer to the municipalities of the state, in a collaborative regime.

Initiatives such as the "Knowledge Route," which is being implemented by the School of Government of Mato Grosso do Sul, and those inspired by the states of Ceará and Espírito Santo, exemplify the importance of intentional investments in policies and programs aimed at strengthening public institutions. Through the continuous qualification of public service workers, in collaboration between the State and Municipalities, these strategies can enhance the benefits of large investments, promoting economic development with social inclusion of the population.

3. Governance and strategic data management

The strengthening of governance bodies in the State of Mato Grosso do Sul is a pressing need, especially in the context of integrated management of data and strategic information. This strengthening is essential to support decision-making at all stages of the public policy cycle - planning, execution and monitoring - both at the state and municipal levels. This focus becomes even more relevant in the Vale da Celulose region, where the implementation of large industrial complexes, such as pulp mills, imposes challenges and opportunities that need to be carefully managed.

This report, especially section 4, is dedicated to a detailed identification of the potential effects that small municipalities face as they become the epicenter of major industrial transformations. These municipalities, when they receive the installation of an industrial pulp complex, are subjected to rapid and profound changes that can drastically transform their socioeconomic and environmental structures. The analysis conducted in the report maps the social, economic and environmental impacts resulting from the installation of the factory and proposes to be a strategic tool for risk management and maximization of the opportunities that arise with these new dynamics. The advent of an enterprise of such magnitude imposes the need for meticulous planning and efficient management, to ensure that the development brought by these industries is sustainable and inclusive.

In view of the potential effects presented in section 4, we propose a set of indicators in section 5 with the purpose of providing robust and continuous support for

government actions. These indicators not only allow the monitoring of the impacts of the project, but also enable the integration of specific indicators of the State Government to ensure a follow-up based on concrete evidence.

The strengthening of governance centers, in this context, becomes more than a goal; It is an indispensable condition to ensure that economic development, promoted by a mega-enterprise such as a pulp mill, is accompanied by social inclusion and well-being for the whole society. The example of Espírito Santo, through the Jones dos Santos Neves Institute (IJSN), and Paraná, with the Integrated Center for Management and Governance (CIG-PR), illustrates how institutional strengthening can be decisive for the success of public policies. These states have invested significantly in improving their data and information management and governance capabilities, which has been crucial to support the planning, execution, and monitoring of economic development policies and programs with social inclusion.

In Espírito Santo, the Jones dos Santos Neves Institute (IJSN) plays a central role in the collection, analysis, and dissemination of data that support government decisions. In order to produce knowledge and support public policies, the IJSN is dedicated to the preparation and implementation of studies, research, plans, projects, and the organization of statistical and georeferenced databases. Its activities cover the state, regional and municipal spheres, with a focus on the socioeconomic development of Espírito Santo. Thanks to the work of the IJSN, governance in the state is strengthened, allowing public policies to be guided by accurate and up-to-date information, aligned with local and regional needs.

Similarly, the Integrated Center for Management and Governance of Paraná (CIG-PR) has played a crucial role in integrating data from various sources, offering a comprehensive and integrated view of the state's economic and social dynamics. The CIG-PR is the result of a strategic partnership with the Foundation for the Support of Research, Teaching and Culture (Fapec), linked to the Federal University of Mato Grosso do Sul (UFMS). This center acts in a network, promoting scientific and technological production through collaboration between various public and private institutions. In addition, the CIG-PR is dedicated to the transfer of technologies and the proposition of new institutional arrangements that can improve the performance of strategies to attract investment to the state, improve infrastructure, education and governance in the state.

These governance centers - both the IJSN, in Espírito Santo, and the CIG-PR, in Paraná - have been instrumental in supporting state governments in formulating policies that seek to balance economic growth with social inclusion and the well-being of citizens. They exemplify how data and information governance can be structured to address complex development challenges and ensure that government actions are evidence-based, thereby promoting sustainable and inclusive development.

In Mato Grosso do Sul, the GOV MS Intelligence Center plays a key role in the reorganization of information, assisting in the prioritization of state investments

through the application of results-based management methodologies. With the ability to compare per capita investment indicators, the center establishes clear priorities for government actions, allowing for rigorous monitoring of the demands in execution. This continuous monitoring process makes it possible for decisions to be based on concrete evidence, increasing both the transparency and the effectiveness of the public policies implemented.

The GOV MS Intelligence Center is closely integrated with another strategic initiative of the State Government such as MS Ativo, whose main objective is to strengthen the exchange of experiences between the State and the municipalities, in addition to improving municipal management. The Active MS seeks to ensure the continuous improvement and successful implementation of public programs and services, promoting more efficient and strategic actions. By connecting the development of institutional capacities, this initiative aims to create a synergy between the different spheres of government, allowing policies to be better targeted and results to be achieved more effectively.

This integration between the GOV MS Intelligence Center and the Active MS exemplifies how a collaborative, data-driven approach can strengthen governance and ensure that public investments are optimized to generate maximum social and economic impact. By aligning the planning and execution of public policies with a solid database of data and analysis, Mato Grosso do Sul is positioned to achieve a more balanced and inclusive development, benefiting the entire population of the state.

The experience of other states demonstrates that strengthening the institutions responsible for data and information governance is essential to face the complex challenges that arise with the implementation of large enterprises in general. The Government of Mato Grosso do Sul has stood out for its technical professionalism in the preparation of its consistent and comprehensive multi-year plan, which unfolds into clear goals, both in terms of focus of action and possibility of measurement. This strategic alignment precisely guides the physical and budgetary execution of government policies, programs, and projects, reflecting the current government's commitment to making the state an increasingly better place to live and invest.

The strategic use of integrated data and qualified information allows anticipating trends, identifying priority areas, and adjusting public policies in real time, promoting more agile and effective public management. States such as Espírito Santo and Paraná have already demonstrated that investment in robust data governance frameworks directly contributes to socioeconomic development. Following this path is, therefore, a crucial opportunity for Mato Grosso do Sul to consolidate its role, both regionally and nationally, in promoting inclusive development.

Finally, strengthening information governance, with a view to data-driven public management, represents the key to transforming challenges into opportunities. With this, the State will be better prepared to deal with global changes, respond

proactively to local demands and, above all, ensure that economic development is accompanied by social inclusion and long-term sustainability.