# Impact of Logistics and Transportation Infrastructures on Angola's Economic Growth. (An Analysis 2020-2024)

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## SUMMARY

This study aimed to analyze the impact of logistics and transportation infrastructure on Angola's economic growth from 2020 to 2024, identifying the main challenges and opportunities for the sector's sustainable development and its contribution to the country's economic diversification. To achieve these objectives, we used a qualitative and quantitative method, supported by documentary, descriptive, and exploratory techniques. This allowed us to collect data through a questionnaire projected on a digital platform (Google Form), addressed in person and via a link to economic agents from various parts of the country, with a particular emphasis on Luanda, Benguela, Cabinda, Namibe, and Zaire. The questionnaire was completed entirely digitally, and the results were obtained in real time. Furthermore, we conducted interviews with some public policymakers related to the sector, via WhatsApp and in person, which allowed us to reach a wide range of stakeholders and obtain real information about the study, enabling us to determine whether or not logistics and transport infrastructures had a significant impact on Angola's economic growth during the period under analysis. To this end, the data were analyzed using tools (Excel, Power BI, LiveGap Charts) and statistical software (SPSS) to best determine the research results, ensuring the security, accuracy, and reliability of the data obtained. It is important to emphasize that the development of logistics and transport infrastructures in Angola between 2020 and 2024 is a fact and can be said to have played a fundamental role in the country's economic growth. Strategic projects, such as the modernization of the Lobito Corridor, the expansion of the Port of Luanda, and the improvement of the road and rail network, helped reduce logistics costs, which boosted trade and strengthened regional integration.

**Keywords:** Logistics infrastructure; Transportation; Economic growth; Angola

## INTRODUCTION

Logistics and transportation infrastructure plays a crucial role in any country's economic development, facilitating the mobility of people, goods, and services, as well as driving regional and international integration. In Angola, a vast country with an economy historically dependent on oil, the modernization and expansion of this infrastructure has been fundamental to economic diversification and improved competitiveness. Between 2020 and 2024, the Angolan government, in partnership with international investors, implemented a series of strategic projects aimed at modernizing ports, highways, railways, and airports. Notable initiatives include the redevelopment of the Lobito Corridor, investments in the Port of Luanda, and the expansion of the air and road transportation network. These actions aim to reduce logistics costs, improve connectivity between provinces, and strengthen national production chains. This study analyzes the impact of these investments on Angola's economic growth, highlighting the main initiatives, their challenges, and future prospects. Through a data- and evidence-based approach, we seek to understand how the logistics and transportation sector has contributed to the diversification of the economy and the improvement of the population's living conditions.

Between 2020 and 2024, Angola implemented significant investments in logistics and transportation infrastructure, boosting economic growth and promoting economic diversification. One of the most notable projects is the Lobito Corridor, a railway line connecting the Port of Lobito to the mineral-rich regions of the Democratic Republic of the Congo and Zambia. In December 2024, the United States announced a $600 million investment to modernize this route, aiming to drastically reduce the transportation time of critical minerals and offer an alternative to Chinese influence in the region. This investment is part of a joint effort with the European Union and the G7, which have already contributed approximately $4 billion to the project. Furthermore, the Port of Luanda underwent a significant modernization of its logistics infrastructure, with an investment of over $250 million. This improvement aims to increase cargo reception capacity, with a volume expected to exceed 30 million tons over the next 10 to 15 years, strengthening regional competitiveness and promoting economic growth.

**Relevance and formulation of the problem**

The logistics and transportation infrastructure sector is one of the fundamental pillars of any country's economic development. In Angola, where the economy has historically been dependent on oil exports, improving transportation infrastructure has become a strategic factor in boosting economic diversification, reducing logistics costs, and strengthening regional integration. Between 2020 and 2024, several projects were implemented with the aim of modernizing highways, railways, ports, and airports, facilitating the flow of agricultural, mineral, and industrial production, as well as improving connectivity between different regions of the country. However, challenges remain related to infrastructure maintenance, management efficiency, and the need for greater investment.

The study is justified by the need to assess the extent to which these improvements have contributed to economic growth, identifying advances, challenges, and opportunities within the sector. Furthermore, it seeks to inform future public policies and investment strategies that can consolidate Angola as a logistics hub in the region. Given this context, the research is guided by the following central question: What was the impact of logistics and transportation infrastructure on Angola's economic growth between 2020 and 2024? From this question, other complementary questions arise: How did investments in transportation and logistics affect the Angolan economy during this period? What were the main advances and challenges faced in implementing these projects? How has transportation modernization contributed to economic diversification and regional trade? What measures can be adopted to further improve the country's logistics and transportation sector? However, the study seeks to answer these questions through an analysis based on economic data, public policies, and interviews with experts in the field.

**Research object**

Logistics and transportation infrastructure is known to play a crucial role in the growth of a given economy. The Angolan government has been implementing a series of strategic projects aimed at improving internal and regional connectivity, boosting key economic sectors and promoting diversification beyond oil. Since Angola needs inputs to leverage this sector, the objective of this study is to analyze how the development and modernization of logistics and transportation infrastructure influence the country's economic growth. This study aims to improve logistics and transportation infrastructure, as they are fundamental pillars of Angola's economic growth, facilitating trade, attracting investment, and promoting regional integration.

**General objective**

- Analyze the impact of logistics and transport infrastructure on Angola's economic growth from 2020 to 2024, identifying the main challenges and opportunities for the sustainable development of the sector and its contribution to the diversification of the country's economy.

**Specific objectives**

Within the scope of the materialization of this research, the following specific objectives stand out:

- Assess the current state of logistics and transport infrastructure in Angola, highlighting the main investments made between 2022 and 2023.
- Analyze the relationship between the modernization of transport infrastructure and the country's economic growth.
- Identify the main challenges faced in the implementation and maintenance of logistics and transport infrastructures.
- Examine the impact of logistics infrastructure on the flow of agricultural, industrial and mining production, as well as on facilitating domestic and foreign trade.
- Interpret data and propose strategies and recommendations to optimize the development of the logistics and transportation sector in Angola.

**Justification**

As discussed previously, studying the impact of logistics and transportation infrastructure on Angola's economic growth is crucial, as the efficiency of these sectors is crucial to the country's sustainable development. Well-structured infrastructure promotes the mobility of goods and people, reduces operating costs, and increases the competitiveness of the national economy. In recent years, Angola has invested in modernizing its transportation and logistics systems, with strategic projects such as the concession of the Lobito Corridor and the development of regional logistics platforms.

However, challenges such as deteriorating roads, limited rail connectivity, and the need for greater integration between different modes of transportation persist. The aim is to assess the impact of logistics and transportation infrastructure on economic growth, highlighting challenges and opportunities for the sector's future. This research is justified by the need to understand how these investments and challenges impact the country's economic growth, especially in the 2020-2024 period. Furthermore, it seeks to provide relevant information for the formulation of effective public policies to attract foreign direct investment and leverage the private sector. From an academic perspective, the research will contribute to the deepening of the literature on infrastructure and economic development in Angola, providing valuable insights and an analysis based on recent data.

In practical terms, it can assist public and private managers in making strategic decisions aimed at improving the logistics and transportation sectors. Analyzing the impact of logistics and transportation infrastructure on Angola's economic growth is essential for identifying development opportunities, strengthening regional integration, and driving the diversification of the country's economy, which is entirely dependent on and dependent on oil. This study may once again encourage public policymakers to pay greater attention to the various existing sectors with great potential to leverage the Angolan economy. The challenges are evident in creating multimodal systems that develop and unite transportation and logistics infrastructure through the attraction of private investment, which aligns with the main recommendations of the Report on Angola's Investment Policy Review (IPR), published by UNCTAD in 2019. With increasing speed, we are diversifying the Foreign Direct Investment portfolio and better aligning projects with the country's needs, as UNCTAD recommended at the time.

It's also worth emphasizing that sustainability is a central concern. Any strategic plan from the Ministry of Transport is strictly aligned with the Sustainable Development Goals established by the United Nations for the 2030 Agenda. We pay particular attention to the objectives of Renewable and Affordable Energy, Decent Work and Economic Growth, Industry, Innovation and Infrastructure, and Sustainable Cities and Communities. We believe that a commitment to the sustainable and harmonious development of the country's infrastructure, leveraging the capital and expertise of private investors, will catalyze national and regional progress. At the same time, this is essential for promoting social and territorial cohesion, economic efficiency and diversification, and strengthening productive capacity, significantly improving the living conditions of the population.

The transportation and storage sector has demonstrated a positive impact on Angola's Gross Domestic Product (GDP). In the fourth quarter of 2022, these activities contributed most to the positive GDP growth, with growth of approximately 36.8% compared to the same period of the previous year. This increase was due to the increase in regional and intercontinental flight frequencies, as well as the expansion of the bus fleet. According to the Minister of Transport, Ricardo Viegas d'Abreu (October 2024), he emphasized that the transportation sector is a

lever for the diversification of the Angolan economy. It is estimated that an annual investment of 1.4% of GDP is needed to close the existing deficit in transportation and logistics infrastructure. The public-private concessions already completed have generated over US$300 million in concession premiums and over US$1.3 billion in associated investments for Angola.

**Historical Context of Infrastructure in Angola**

The evolution of logistics and transportation infrastructure in Angola is directly linked to its historical context, from the colonial era to the challenges and advances of the post-independence period. According to Pereira, J. (1999), from the colonial period until Portuguese colonization in 1975, infrastructure construction focused on the exploitation of natural resources and connecting productive areas to ports for export. Major projects included: the construction of railways such as the Benguela Railway (CFB), essential for the export of minerals from the central region; the development of strategic ports (Luanda, Lobito, Namibe) for the transport of agricultural and mineral products; and the implementation of a rudimentary road network connecting some major cities. Although some infrastructure was built, its primary objective was to serve colonial interests, with little concern for the country's internal development (Pimentel, 1990).

In the post-independence and civil war period, from 1975 to 2002, Angola faced a devastating civil war that had a significant impact on the country's infrastructure. During this period, existing infrastructure was destroyed or dismantled (Pereira, 2005). The main features were infrastructure destruction, which resulted in the destruction of roads, railways, ports, and bridges; regional isolation, where the areas most affected by the war, such as the interior and east of the country, became increasingly isolated, hindering the transportation and circulation of goods; as well as dependence on imports, caused by the destruction of internal infrastructure, Angola became heavily dependent on imports for essential goods (Lopes, 2007).

Regarding the period of reconstruction and expansion from 2002 to 2014, history tells that after the end of the civil war in 2002, Angola began a vast program to rebuild its infrastructure, driven by resources from oil and financed, in large part, by loans from international partners, especially China (Santos, 2013). According to Chaves, F. (2011), the main characteristics focused on the following actions: Rehabilitation of railways and highways, with a focus on the reconstruction of the Benguela Railway (CFB) and the expansion of national roads were fundamental to improving connectivity and facilitating trade;

Port and airport development, with the Port of Luanda being modernized and new airports, such as Luanda International Airport, undergoing expansion, as well as major urban projects, with the government investing in the construction of new cities and urban infrastructure, such as the central hubs in Luanda. Finally, a period of diversification and sustainability emerged from 2015 to 2024, when Angola began to face the oil crisis and seek new ways to diversify its economy (Moreira, 2018). In this context, infrastructure began to be seen as a driver of sustainable growth and greater regional integration.

Below are the main characteristics, as listed (Lima, 2020):

- Development of logistics corridors: The Lobito Corridor was a key project to improve access to regional markets, connecting Angola with the Democratic Republic of the Congo (DRC) and Zambia.
- Innovations in the transport sector: The modernization of ports, railways and urban transport networks has been combined with digitalization and the use of logistics management technologies.
- Urban mobility: Expansion of public transport systems in major cities, especially in Luanda.

Therefore, the historical context of infrastructure in Angola reflects the transition from a colonial model of exploitation to a post-war reconstruction effort and, more recently, a focus on diversification and economic sustainability, where the role of infrastructure in Angola's economic growth has been central, especially with regard to logistics and transportation, which are essential for connectivity and regional and international integration, attracting more investors.

## Logistics and Transport Infrastructure in Angola

Angola's logistics and transportation infrastructure plays a crucial role in the country's economic development, facilitating the movement of goods, services, and people, and enabling integration with international markets. The evolution and current state of this infrastructure reflect both historical challenges and efforts to modernize and expand the sector.

- Road Infrastructure, Current Status and Development

Angola's road network is essential for the internal transport of goods and people. During the civil war (1975-2002), many roads were damaged, but since 2002, the government has invested heavily in rebuilding and expanding highways.

Investments: The Angolan government has focused on building long-distance roads connecting inland regions to the coast.

National Road 100 and National Road 230 are examples of large road infrastructure projects.

Challenges: Despite the progress, challenges still exist, such as the need for maintenance and the expansion of the network to more remote and less developed areas.

### Railway Infrastructure, History and Recent Advances

Railways have been essential for transporting heavy cargo, such as minerals and agricultural products. The civil war destroyed most of the country's railways, but in recent years, there has been considerable effort to restore and expand this infrastructure. Benguela Railway (CFB): The CFB, one of Angola's main railway corridors, was completely rehabilitated with investments from Chinese companies. It connects Angola to the Democratic Republic of the Congo (DRC) and Zambia. Other Railway Projects: The Luanda Railway and the Moçâmedes Railway were also restored and expanded to improve national and regional integration (Rodrigo, 2017).

### Port Infrastructure, Importance for International Trade

According to Kalu, O. (2014), Angola's ports play a central role in the country's international trade. The Port of Luanda, the Port of Lobito, the Port of Namibe, and the Port of Cabinda are the main maritime terminals. These ports are essential for the flow of oil, minerals, agricultural products, and other consumer goods. Modernization and Expansion: The Port of Luanda has undergone significant modernization, with the construction of new cargo terminals and expanded capacity. The construction of the new Port of Luanda, with significant investments, aims to improve port infrastructure. Lobito Logistics Corridor: This corridor connects the Port of Lobito to Zambia and the Democratic Republic of the Congo, facilitating the transport of goods from the interior region to international markets (Pereira, 2009).

### Airport Infrastructure, Development and Modernization

Pimentel, M. (2007) and Lima, R. (2019), state that the aviation sector has been one of the focuses of modernization in Angola, with increased investments in airport infrastructure. The 4 de Fevereiro International Airport, in Luanda, is the country's main air hub, receiving flights from various parts of the world. Recent Investments:

The airport has been expanded and modernized, with new terminals and improvements in security and passenger service. Domestic Aviation: There is growing interest in strengthening regional aviation, with new airports being built in major provinces.

### Information Technology Infrastructures, Impact on Modern Logistics

According to Santos, L. (2015), in recent years, Angola has been striving to modernize its technological and logistical infrastructure, aiming to better integrate its physical infrastructure with information systems. Tracking systems, real-time logistics, and automation are being implemented to improve efficiency.

Transportation Management Systems (TMS) and Warehouse Management Systems (WMS) are being adopted to improve inventory management and the flow of goods. Challenges: The digitalization of logistics still faces obstacles, such as the lack of internet infrastructure in remote areas.

From this perspective, logistics and transport infrastructure in Angola has evolved significantly since the end of the civil war in 2002, with substantial investments in roads, railways, ports and airports.

However, the country still faces challenges, such as the need for greater regional integration and technological modernization to optimize logistics flows. The role of these infrastructures is crucial for sustainable economic development and for improving Angola's competitiveness in the global market.

The history of Angola's infrastructure reflects the country's challenges and advances. From colonial exploitation to the destruction of the civil war and current reconstruction efforts, the transportation sector has been an essential pillar of economic development.

Today, Angola seeks to consolidate its infrastructure to become a strategic logistics hub in Africa and ensure a more diversified and sustainable economy.Transportation infrastructure is crucial to Angola's GDP growth. Efficient roads, railways, ports, and airports reduce logistics costs, boost trade, attract investment, and generate jobs, creating a positive cycle for economic development.

In recent years, investment in this sector has been a key factor in diversifying the economy and reducing dependence on oil, demonstrating that the expansion and modernization of transportation are essential for sustainable economic growth. All of the country's deepwater ports play a fundamental role in supporting the government's objectives in the economic development of Angola as a country and its role on the African continent. The government believes there is potential for the private sector to finance new projects planned for the coming years, where costs would be shared 50-50 between the port owner (public sector) and the operator (private or public sector).

The environmental impact of developing existing ports would be low as this would take place in areas already affected by port activity, while the impact of new ports would be studied in detail as part of the project development.

Private sector involvement could also take the form of greater private participation in stevedoring activities (container, bulk and conventional cargo) in the ports of Luanda, Cabinda, Lobito and Namibe.

As can be seen, policies aimed at logistics infrastructure and transportation have been a concern of the government to promote development and embrace opportunities for structural transformation. Given that the economy is entirely dependent on oil exploration, everything has been done to ensure Angola can move towards economic diversification, investing heavily in this sector.

## MATERIALS AND METHODS

### Methodology

This research adopts a qualitative and quantitative methodology, addressing the impact of transportation logistics infrastructure on Angola's economic growth. The approach adopted is deductive, drawing on general theories and concepts (infrastructure, logistics, transportation, and economic development) to analyze the specific case of Angola from 2020 to 2024. To achieve these objectives, we used the following research methods and techniques.

**- Qualitative:** According to Thiollent (2007), this method aims to answer questions that provide insight into the project and its surrounding environment, enabling better analysis of the situation and theorization of the problem. To this end, adopting this method for our research allowed us to analyze the phenomena related to the impact of logistics and transportation infrastructure on the lives of the Angolan population.

**- Quantitative**: It consists of reducing social, political, and economic phenomena, which provides a greater

likelihood of measuring and processing data (Marconi and Lakatos 2003). The use of this method was relevant to the research process, as it helped us quantify the data, find relationships between variables using statistical analysis of the data collected through the questionnaire, select theories, and draw conclusions using a representative sample of respondents to analyze their impact on family lives.

**Research techniques**

**- Descriptive Technique**: The descriptive technique is an approach in scientific research that focuses on the detailed analysis and interpretation of data to describe a specific phenomenon or situation. It provides a comprehensive and detailed overview of the object of study, without necessarily seeking causal explanations, as it seeks to identify and characterize the main logistics and transportation infrastructures in Angola. In our study, applying this technique allowed us to analyze in detail the perceptions, living conditions, and livelihoods of families. This descriptive approach provided a deeper and more contextualized understanding of the phenomenon, providing important data and recommendations with valuable arguments to guide future policies related to logistics and transportation infrastructure in Angola.

**- Exploratory Technique:**The exploratory approach in scientific research is a strategy that seeks to investigate a phenomenon without relying on pre-established hypotheses. This technique stands out for its flexibility, allowing for the exploration of new discoveries and an in-depth analysis of the phenomenon in question. For our study, it was useful for understanding the population's perceptions of the subject under analysis.

**- Documentary Research**: Documentary research is a type of research that uses primary sources, that is, data and information that have not yet been treated in scientific analysis or research.

According to Rodrigues (2007), documentary research serves to answer someresearch problemspecific, especially to complement abibliographic research. Regarding our research, the use of this technique allowed us to examine documents, legislation, institutional reports, books, articles, and studies related to the topic, which allowed us to obtain a broader and more in-depth view related to the topic under study.

**Data Collection Sources and Techniques**

For our study, primary and secondary sources were used:

- **Secondary sources**:

Reports from INE – National Institute of Statistics of Angola;

MINTRANS Reports – Ministry of Transport;

Publications of the National Bank of Angola, World Bank, IMF and AfDB;

Scientific articles, books and academic studies on infrastructure and economic growth.

- **Primary sources**:

Interviews with experts in logistics and economics;

Questionnaires administered to public managers, transport technicians, or businesspeople in the logistics sector.

**Research procedures**

According to Lakatos & Marconi (1991), data collection procedures are a set of precepts or processes used by a science, which correspond to the practical part of the collected and observed content. The procedures used in collecting research data were: bibliographic research, questionnaires, and observation. The procedures allowed us to understand how the research was conducted and the steps taken to achieve the proposed objectives, adopting the research in terms of nature, approach, data processing, objectives, and data processing procedures, as described below.

Therefore, the research was applied in nature, addressing a specific issue. The study focused on determining whether the transport logistics infrastructure sector has actually had a positive impact on economic growth and proposing measures to improve it. The approach to the problem is qualitative and quantitative, as the collected data were qualified and subsequently quantified, analyzed, and interpreted using specific data analysis and processing tools. The objectives are exploratory, as an exploratory study of the main research objective was conducted, as well as the formulation of the study's hypotheses.

Regarding data processing procedures using descriptive statistics, once the data were collected, they were tabulated and then transformed into graphs, which allowed us, through data analysis procedures, to analyze and discuss each question inserted in the questionnaire in order to understand the relationship between the variables and reach the appropriate conclusions and issue possible suggestions and recommendations, as well as leave clues for future researchers who will have the possibility to develop related research.

**Data collection and survey**

The data required for our study were collected through a questionnaire designed on a digital platform (Google Form), distributed in person and via email to economic agents from various parts of the country, with a particular emphasis on Luanda, Benguela, Cabinda, Namibe, and Zaire. The questionnaire was completed entirely digitally, and the results were obtained in real time. Furthermore, we conducted interviews with some public policymakers related to the sector, via WhatsApp and in person. This method of data collection allowed us to reach a wide range of stakeholders and obtain real information about the study.

**Data Analysis and Triangulation**

To ensure the relevant findings, quantitative data were analyzed using tools (Google Form, Excel, Power BI, LiveGap Charts) and statistical software (SPSS). These tools ensured the security, accuracy, and reliability of the data obtained. Furthermore, qualitative data were analyzed using thematic content analysis techniques, allowing us to identify patterns and emerging themes, providing a more accurate and cross-sectional understanding of the perceptions and challenges related to the topic under study. Interview questions and focus group discussions were transcribed and coded using SPSS statistical software to facilitate content and thematic analysis. This allowed us to present a more systematic and detailed interpretation of the data collected, identifying patterns, trends, and relevant data for the study.

**Research universe**

This constitutes the larger population from which the sample comes, to provide clear insights into the phenomena being measured. The research covers two specific groups, namely:

- Sector worker: Employee aged between 18 and over 55.

-Academics, public policy executors and the general population: in which agents residing in Angola were considered more.

This group was selected based on relevant age groups and civil service positions. This ensured valuable information and an in-depth analysis that could involve everyone, fostering a better understanding and achieving reliable results that could serve as valuable insights for improving the sector. The universe, or population, will represent the set of elements on which the study will focus. It is important to note that the Angolan population is estimated at approximately 38,351,339 inhabitants throughout the national territory. Given its large size, based on the questionnaire distribution, we obtained a sample (the term used to describe any subset of a given population intended to reproduce the reality studied). This sample lacks adequate representation to maintain the population's characteristics. For our study, we obtained a universe of 416 individuals, consistent with the aforementioned target audience.

**Sample Size and Justification**

The sample size was determined based on the study objective and the criteria of accessibility, time, and available

resources. Because this is both a qualitative and quantitative study, two distinct sampling strategies were used:

**Qualitative Sample:**For the qualitative component (interviews or open-ended questionnaires), intentional or convenience sampling was used, selecting key informants with experience or direct links to the transport and logistics sector in Angola. We included representatives from public institutions (MINTRANS, INEA), managers of private transport or logistics companies, and academics and specialists in the field of economics and development.

**Quantitative Sample:**For the quantitative data analysis, primary documentary and statistical sources were used, such as data collected from interviews and questionnaires, which were quantified in tables and interpreted cautiously. In this case, there is no conventional sample, but rather a time series analysis from 2020–2024 with data collected from respondents.

**Justification:**The number of participants and data analyzed was considered adequate to achieve the study's objectives, considering factors related to the specific thematic focus, limited access to certain official data, and the interest in in-depth understanding, not just statistical generalizations.

**Sample size calculation**

Calculating sample size requires the influence of highly specialized statistical procedures, based on basic formulas for calculating the sample size of a population.

Therefore, our sample took into account Angolans residing in the most different provinces in the order of 216 individuals, workers in the sector in the order of 61 elements, academics and civil society in the order of 21 and executors of public policies, in the order of 4 elements, making the total sample of 302 members who responded to the questionnaire for the materialization of the study, selected from a universe of approximately 736 elements as shown in the following data:

**Data:**

N= 416 Angolans

$E_o$ =0.03 = 3%

n=?

$n_o$ =?

**Formula** $n_0 = \frac{1}{E^2}$

**Resolution**

$n_o = 1 / (E_o)^2$

$n_o = 1 / (0.03)^2$

$n_o = 1111$

$n_o = (N \times n_o) / (N + no)$

$n_o = (416 \times 1111) (416 + 1111)$

$n_o = 462,176 / 1,527$

$n_o = 302.6$

$$n = 1 + \frac{N.n_{\circ}}{N + n_{\circ}}$$

$n_{\circ}$ = 302.6 observing the rounding down we will have $n_{\circ}$ = 302 Respondents.

With a tolerable sampling error of 3%, 302 was the number of respondents who filled out the questionnaire.

**Significance level test:**

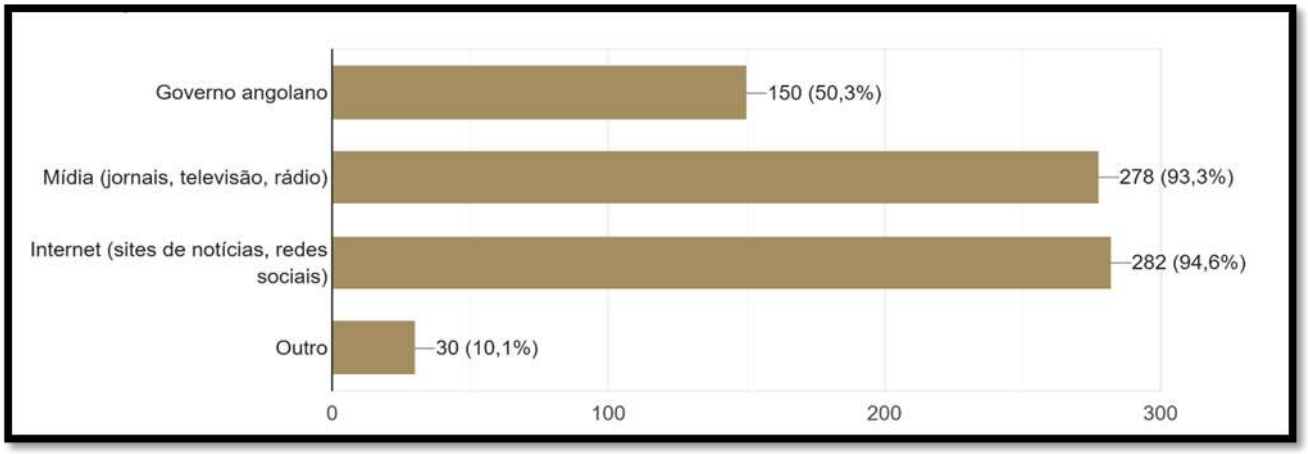
Formula: $= = 72.5\%\frac{n.100}{N}\frac{302x100}{416}$

Based on the calculations, this implies that our sample is considered representative and significant because the significance test is greater than 50%, based on Daniel Bernoulli's theory, which states that when the sample result of the test is equal to or greater than 50%, the sample is considered significant.

## RESULTS AND DISCUSSION

### Knowledge and perception of logistics and transport infrastructure

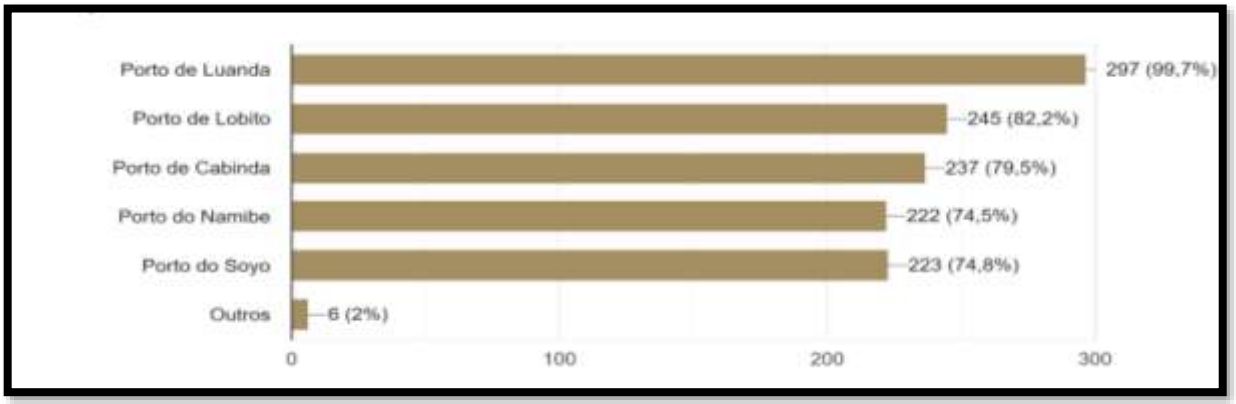
**Chart 1. Sources of infrastructure knowledge acquisition**




Source: Own authorship, (2025)

Internet: 282 people (94.6%); Traditional media: 278 people (93.3%); Angolan government: 150 people (50.3%); Other: 30 people (10.1%). The internet and traditional media are the dominant means of accessing information about logistics, demonstrating the importance of digital and journalistic channels in shaping public opinion. The government's institutional communications still need to be strengthened.

**Chart 2. Known transport infrastructures**




Source: Own authorship, (2025)

Port of Luanda: 297 people (99.7%); Port of Lobito: 245 people (82.2%); Port of Cabinda: 237 people (79.5%); Port of Namibe: 222 people (74.5%); Port of Soyo: 223 people (74.8%); Others: 6 people (2%). The Port of Luanda is almost universally recognized, followed by other strategic coastal ports. This demonstrates a certain degree of geostrategic knowledge of the population regarding the country's main logistics corridors.

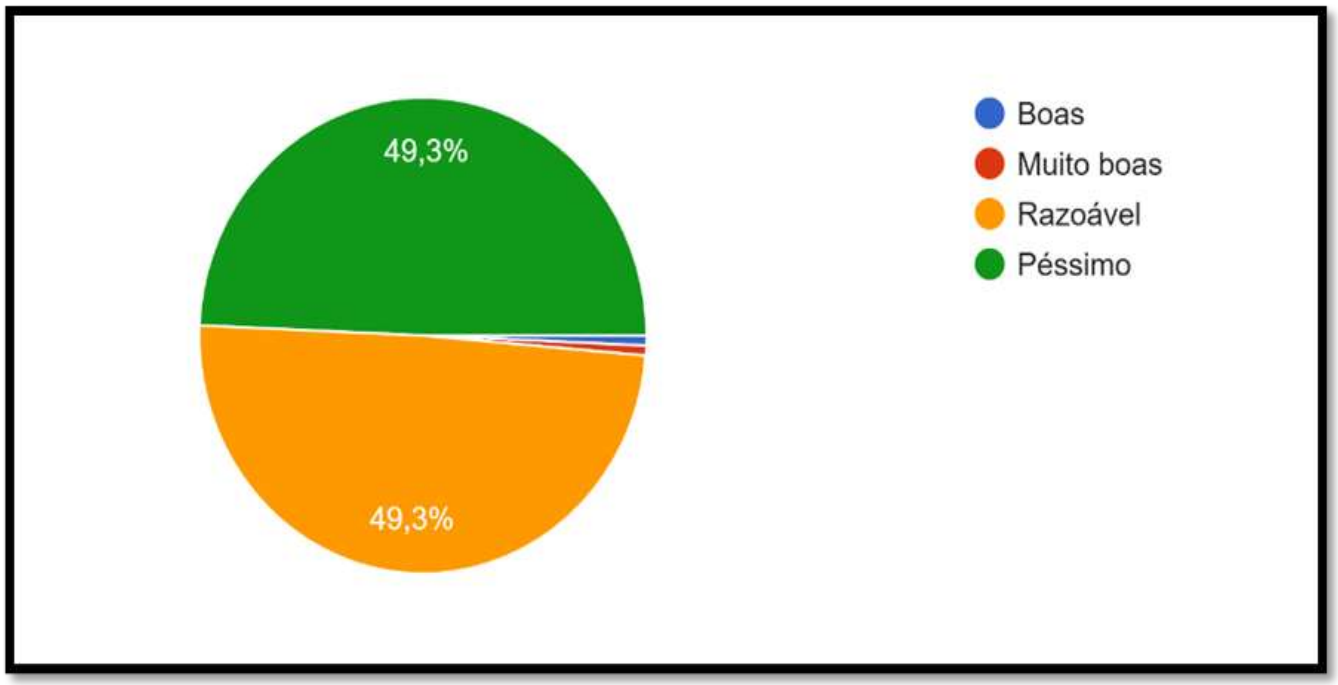
## DISCUSSION

The objective of this study is to analyze how the development and modernization of logistics and transportation infrastructure influences the country's economic growth. This improves logistics and transportation infrastructure, which are fundamental pillars of Angola's economic growth, facilitate trade, attract investment, and promote regional integration and access to employment. To confirm these theoretical arguments, the following are respondents' reactions to the study's main questions, which were the subject of debate and discussion to arrive at a more accurate conclusion.

### Assessment Assessment of infrastructure policies

Respondents' assessment of infrastructure policies is a fundamental tool for improving public management and ensuring that policies meet the real needs of the general population. By gathering respondents' opinions, policymakers in the sector can make more informed decisions, increasing public trust in public institutions. This was crucial for this study because respondents had the privilege of expressing their evaluative views on logistics and transportation infrastructure, as shown in the graph below.

**Chart 3. Assessment of infrastructure policies**

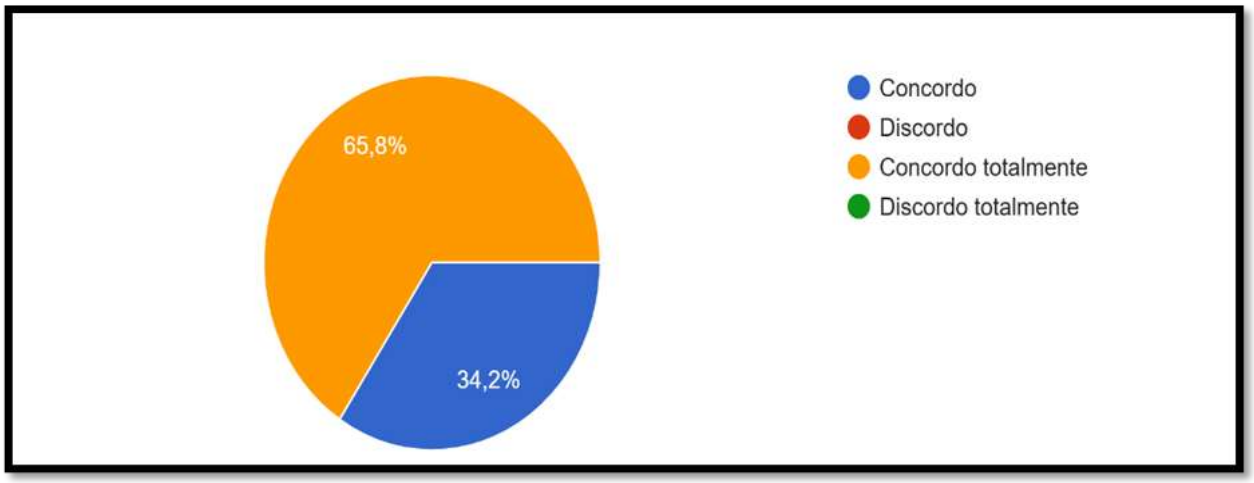



Source: Own authorship, (2025)

Regarding the graph under analysis, it is clear that respondents' assessment of infrastructure policies is extremely critical: the data collected showed that 49.3% found the policies "reasonable," while the same number of respondents, on the negative side, stated that they were "terrible." Only 1.4% considered the policies satisfactory, giving a positive assessment. It is worth noting that the assessment of infrastructure policies involves analyzing whether public actions aimed at the construction, maintenance, and expansion of roads, transportation, and logistics systems are meeting the population's needs and promoting sustainable development. Given the situation, it is clear that serious investment in this area of action is needed so that the paradigm of logistics and transportation infrastructure can take on a new form in the Angolan socioeconomic landscape and contribute to the development of communities and regions. Therefore, the government needs to develop policies to further

promote this sector, ensuring that the population develops a different perception of the matter in the coming years.

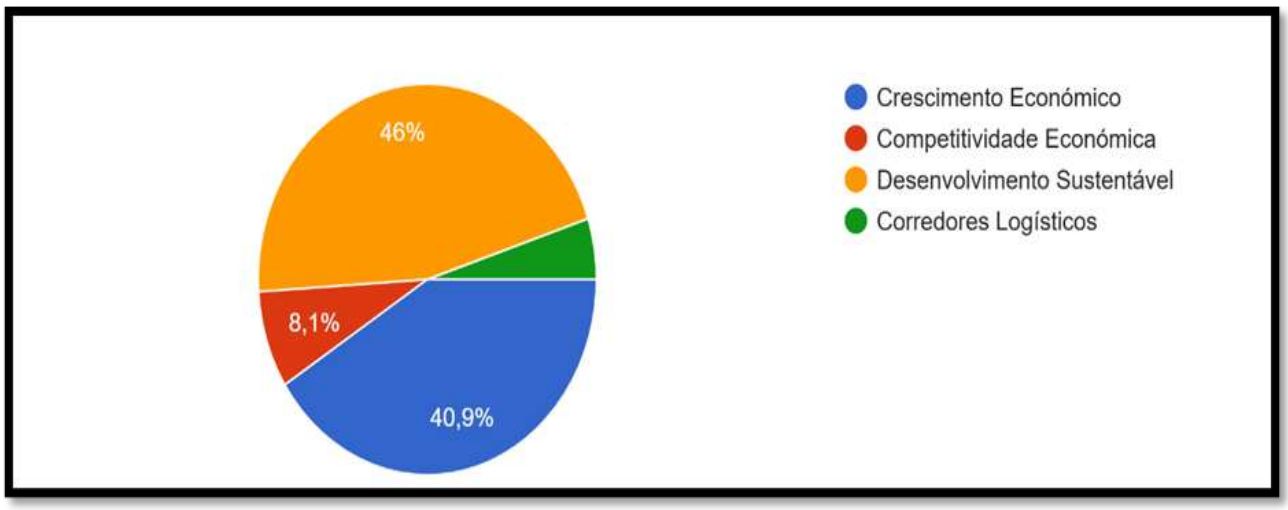
**Chart 4. Importance of infrastructure for the economy**




Source: Own authorship, (2025)

Strongly agree: 196 people (65.8%); Agree: 102 people (34.2%); Disagree/Strongly disagree: 0. There is complete consensus on the importance of logistics infrastructure for the Angolan economy, which indicates a clear perception of its strategic role. The greatest importance is placed on Sustainable Development: 137 people (46%); Economic Growth: 122 people (40.9%); Economic Competitiveness: 24 people (8.1%); Logistics Corridors: 15 people (5%). Respondents link infrastructure to sustainable development and economic growth, indicating a broad perception of the positive effects of these investments, as shown in the following graph:

**Chart 5. Reactions to the importance of infrastructure**

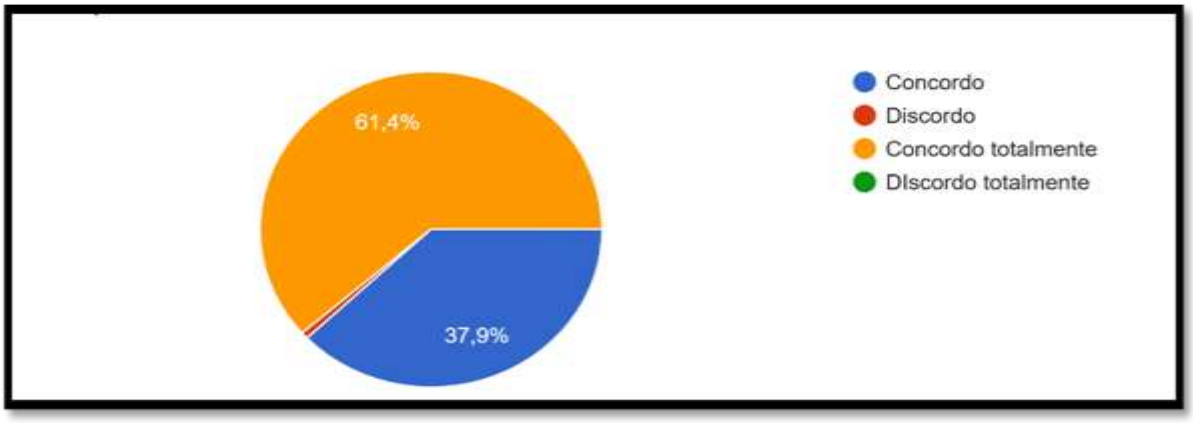



Source: Own authorship, (2025)

**Impact of infrastructure on economic growth**

Logistics and transportation infrastructure are fundamental elements for the structural transformation of any economy. In Angola, a country with a vast territory and diverse geography, these infrastructures are even more strategic, as they serve as a bridge between the productive potential of inland regions and domestic and foreign consumer markets. These infrastructures ultimately play a crucial role in the Angolan economy, shaping the opportunities, challenges, and quality of life of the population. This question was posed for our study to assess whether policies have actually impacted economic growth, as reflected in the following graph.

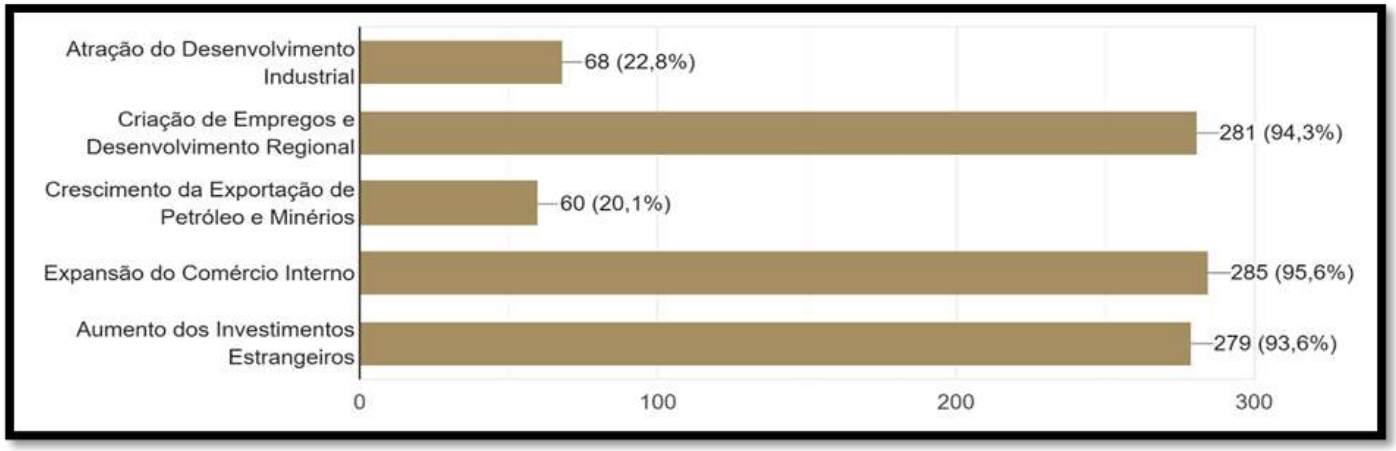
**Chart 6. Reactions to infrastructure and its impact on the economy**




Source: Own authorship, (2025)

The results show evidence that logistics and transportation infrastructure has significantly impacted economic growth. This analysis was made possible by data collected from respondents, which showed that of the 302 sample members representing the 100% percentage margin, 183 members, corresponding to 61.4%, strongly agree, and 37.9% agree that logistics and transportation infrastructure has significantly impacted economic growth. This essentially leads us to urge the government to continue investing seriously in this sector to promote sustainable development, ensure the attraction of foreign direct investment, and focus on the diversification of the national economy.

**Graph 7. Reactions to perceived visible impacts**




Source: Own authorship, (2025)

Regarding the visible impacts of the sector on the Angolan economy, respondents listed the expansion of domestic trade: 285 people (95.6%); job creation and regional development: 281 people (94.3%); foreign investment: 279 people (93.6%); attracting industrial development: 68 people (22.8%); and growth in mineral/oil exports: 60 people (20.1%). Most respondents associate infrastructure with boosting the domestic market and attracting investment, while fewer perceive direct effects on heavy industry or resource exports.

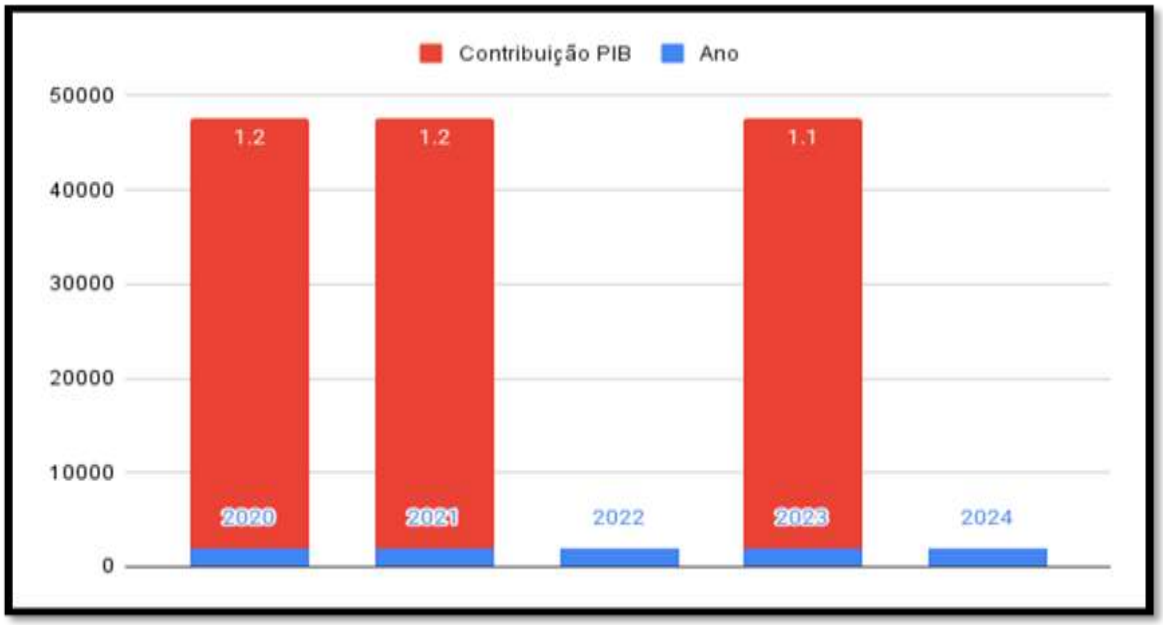
The survey results reveal a high level of public awareness and interest in Angola's logistics and transportation infrastructure. Most respondents consider this infrastructure essential for the country's economic development, highlighting its impact on job creation, domestic trade, and foreign investment. Despite this, the assessment of current policies is predominantly negative, highlighting the urgent need for structural reforms, solid investment, and effective public policies. The suggestions provided by respondents reflect a clear desire for modernization, efficiency, and greater institutional accountability so that the logistics and transportation sector can truly drive the national economy sustainably.

**Impact of infrastructure on Angolan GDP 2020-2024**

Logistics and transportation infrastructure has a fundamental influence on Angola's Gross Domestic Product (GDP), especially in the last four years. The modernization and expansion of these infrastructures were necessary for economic growth, enabling greater efficiency in trade, distribution, and regional connectivity. Between 2020 and 2024, logistics and transportation infrastructure played an important role in the recovery and diversification of the Angolan economy. Despite this, the oil sector remains dominant. Investments in infrastructure, especially in transportation, energy, and public services, contributed significantly to non-oil Gross Domestic Product (GDP) growth.

Regarding infrastructure investments, the National Development Plan (PDN) 2023-2027 highlights the importance of infrastructure for sustainable economic growth, with a focus on improving transportation and logistics networks, expanding access to electricity and drinking water, and developing social infrastructure. These investments aim not only to boost economic growth, but also to improve the quality of life and reduce social inequalities within the population.

Chart 1: Impact on GDP




Source: Own authorship, based on INE data (2025)

According to the table above, in 2020, the sector contracted by 38.7%, mainly attributed to the impacts of the COVID-19 pandemic, which negatively affected mobility and economic activity in general, contributing 1.2% of GDP. In 2021: The sector contributed 1.2% of GDP, a significant increase compared to the previous year. In 2022: The contribution increased to 3.0% of GDP, reflecting continued investment and the expansion of logistics activities. In 2023: The sector registered growth of 19.4%, contributing significantly to the increase in non-oil GDP. In 2024: Although specific data on the sector's contribution are not yet available, continued growth in non-oil GDP suggests a positive contribution. However, non-oil GDP grew 3.9%, indicating a continued positive contribution from non-oil sectors, including logistics infrastructure and transportation (INE, 2025). This growth was driven by infrastructure investments and the resumption of economic activities, especially in transportation and the provision of logistics services, highlighting the strategic importance of the sector in the process of diversifying and strengthening the Angolan economy. In the academic arena, the debate on the determinants of economic growth has been ongoing for a long time. Due to the constant search for mechanisms that ultimately achieve economic growth, it has resulted in a large number of public policy suggestions, among which investments in logistics infrastructure stand out (Fortunato & Silva, 2007). A positive relationship between infrastructure and short- and long-term economic growth has been confirmed (Ferreira & Ellery Jr., 1994; 1996). The effects observed in an economy with adequate infrastructure are enormous, as they stimulate private investment, competitiveness, and exports. Therefore, the development of logistics and transportation

infrastructure is fundamental to sustainable economic growth. It is sufficient to develop adequate investments and overcome challenges for the country to continually improve its position. The analysis of the period from 2020 to 2024 is beneficial because it allowed us to understand current trends to address future ones and the effectiveness of implemented policies. This fact led us to reject the second hypothesis, which suggests that logistics and transportation infrastructure did not have a significant impact on Angola's economic growth, as the research results proved this claim otherwise. Since between 2020 and 2024, Angola made significant progress in improving its logistics and transportation infrastructure, these efforts resulted in a robust recovery of the sector. contributing to the country's economic growth and laying the foundations for greater regional diversification and integration.

## CONCLUSION

In conclusion, it is clear that logistics and transportation infrastructure plays a fundamental role and had a significant impact on Angola's economic growth between 2020 and 2024, improving regional competitiveness and promoting economic diversification. The results show evidence that logistics and transportation infrastructure has significantly impacted economic growth. According to the data collected, of the 302 sample members representing the 100% percentage margin, 183 members, corresponding to 61.4%, strongly agree, and 37.9% agree that logistics and transportation infrastructure has significantly impacted economic growth. This essentially leads us to urge the government to continue investing seriously in this sector to promote sustainable development, ensure the attraction of foreign direct investment, and focus on the diversification of the national economy. Data collected on the National Institute of Statistics' website coincide with the results of this research, demonstrating that the period from 2020 to 2024 highlighted the importance of infrastructure in Angola's economic diversification process. Strategic investments in this sector not only boosted non-oil GDP growth but also contributed to job creation, improved public services, and reduced regional inequalities. Continued investment in these sectors is essential to ensure sustainable and inclusive economic growth in the country. The sector's growth trend indicates a positive trajectory for the Angolan economy, where continued investment in logistics infrastructure and the modernization of transportation systems are crucial to sustaining this growth and increasing the country's competitiveness in the international market.

Based on the data collected, it was observed that between 2020 and 2024, the logistics and transport infrastructure sector proved to be an essential pillar for Angola's economic recovery and diversification. After a sharp contraction in 2020 due to the COVID-19 pandemic, the sector experienced a significant decline of -38.7% in 2020, but subsequently began an accelerated recovery trajectory, where: In 2021: Recovery with growth of +28.9% and stabilization of the contribution to GDP at 1.2%. In 2022: A significant increase to 3.0% of GDP was observed, indicating a strong recovery and expansion. In 2023: Growth of +19.4% was recorded, sustaining the positive performance of non-oil GDP (+3.9%). As for 2024: While specific data is not yet available, projections estimate positive growth within the non-oil sector's growth trend. However, these results reflect the Angolan government's efforts to invest in road, rail, port, and airport transportation infrastructure, as well as in improving storage and logistics services. This not only boosts the production sector and facilitates the flow of agricultural and industrial production, but also improves people's mobility and integrates the country's regions, enhances the expansion of domestic trade, promotes job creation and regional development, boosts foreign investment, attracts industrial development, and increases export growth, all of which are critical factors for Angola's sustainable and inclusive development.

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