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Integrated Analysis of the Impact of Corridor Development: Case Study – The Lobito Corridor

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ABSTRACT

This thesis presents an integrated analysis of the multifaceted impacts of the Lobito Corridor, a major transnational infrastructure initiative revitalizing the rail and trade link between the Angolan port of Lobito and the inland regions of the Democratic Republic of the Congo (DRC) and Zambia. While corridor development is frequently promoted as a catalyst for economic growth, its effects are complex, multi-scalar, and often unevenly distributed. Existing literature often focuses on singular dimensions, such as macro-economic trade metrics or localized livelihood displacements, creating a fragmented understanding. This study addresses this gap by developing and applying a holistic analytical framework to assess the corridor's simultaneous economic, social, and environmental implications.

The research employs a mixed-methods case study approach, combining quantitative data on trade volumes, investment flows, and transport efficiency with qualitative data gathered through semi-structured interviews with key stakeholders—including government officials, private sector investors, local community leaders, and civil society organizations—and field observations along the corridor's route. This methodology allows for a triangulation of data, capturing both the top-down strategic objectives and the bottom-up lived experiences.

Preliminary findings indicate a dualistic impact. On one hand, the corridor demonstrates significant potential to enhance regional integration, reduce transit costs for mineral exports (particularly copper and cobalt), and attract foreign direct investment. On the other hand, the research identifies critical challenges, including risks of economic exclusion for local SMEs, socio-economic disparities between corridor "haves" and "have-nots," land tenure conflicts, and potential environmental degradation from accelerated resource extraction and increased traffic. The analysis reveals that the corridor's benefits are not automatic but are contingent upon robust governance structures, inclusive policies, and strategic mitigation of negative externalities.

This study concludes that the Lobito Corridor is a transformative but contentious project whose ultimate success hinges on moving beyond a narrow focus on logistics efficiency. It contributes to the broader discourse on transport geography and development studies by arguing for the necessity of integrated planning that prioritizes sustainable and equitable development alongside infrastructural advancement. The thesis offers policy recommendations aimed at maximizing the corridor's positive contributions while safeguarding vulnerable populations and ecosystems, providing a critical evaluation for policymakers and a replicable framework for analyzing similar corridor projects globally.

Keywords: Transport Corridor, Economic Development, Regional Integration, Impact Assessment, Lobito Corridor, Infrastructure, Sustainable Development, Angola, DRC, Zambia, Mixed Methods.

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ABBREVIATIONS

ADF – African Development Fund
ADPP – Ajuda de Desenvolvimento de Povo para Povo Angola
AFC – African Finance Corporation
AfDB – African Development Bank
AGL – Africa Global Logistics
APRA – Agriculture Policy Research in Africa
BRI – Belt and Road Initiative
CCCC – China Communication and Construction Company
CSIS - Center for Strategic and International Studies
CFB: Caminho de Ferro de Benguela
DRC: Democratic Republic of the Congo
EV - Electric Vehicle
FPE: Feminist Political Ecology
ICGLR - International Conference on the Great Lakes Region
IPA – Investment Promotion Authority
LAR – Lobito Atlantic Railway
LC – Lobito Corridor
LCIPA – Lobito Corridor Investment Promotion Authority
LCP – Lobito Corridor Project
LAPSSET – Lamu Port–South Sudan–Ethiopia Transport
MOU – Memorandum of Understanding
NGO – Non-Governmental Organisation
NCGF30 - NORTHERN CORRIDOR GREEN FREIGHT STRATEGY 2030,
NSC: North South Corridor
OECD – Organisation for Economic Co-operation and Development
PGI – Partnership for Global Infrastructure and Investment
PPP – Public-Private Partnership
SDI – Spatial Development Initiatives
SME – Small and Medium Enterprises
TAZARA – Tanzania–Zambia Railway Authority

CHAPTER 1 – INTRODUCTION

1.1. Background of the Study

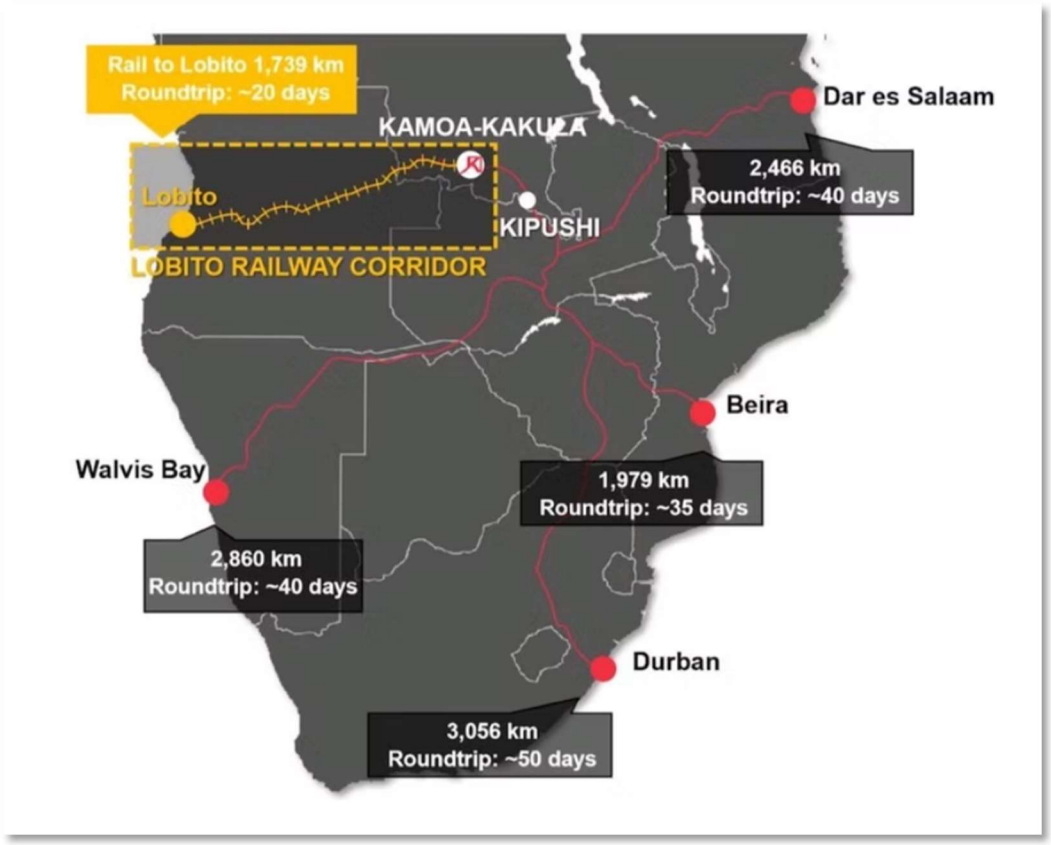
Corridor development represents a comprehensive and well-structured long-term strategy, typically extending over a substantial timeframe of two decades or more. This extensive planning process involves multiple carefully coordinated phases designed to achieve its overarching goals effectively and efficiently. The Lobito Corridor, anchored by the Port of Lobito located on the Atlantic coast in Angola and connected inland by the rehabilitated Benguela Railway, has emerged as one of the most strategic initiatives in Southern and Central Africa. (Hobbs and Juffe-Bignoli, 2022)

This vital infrastructure link significantly supports and enhances trade relations among Angola, the Democratic Republic of Congo, Zambia, and Namibia, thereby promoting a strong sense of regional economic connectivity, integration, and interdependence among these nations. Furthermore, international development agencies and organizations from around the globe highly regard the Lobito Corridor as a fundamental and crucial factor that contributes to regional economic growth, stability, and overall prosperity in the area. (United Nations Zambia, 2024)

Existing studies and analyses conducted to date have primarily focused on evaluating the economic impacts associated with this corridor development initiative. However, despite the wealth of information available regarding the economic benefits derived from such projects, there remains a noticeable gap in the comprehensive understanding of the integrated and holistic analysis of economic, social, and environmental effects on the local communities that reside within the broader influence of the corridor. Gathering this vital information is essential for undertaking a comprehensive assessment to evaluate whether the corridor effectively acts as a catalyst for enabling sustainable regional development that genuinely benefits all stakeholders involved in the process. (Bruinsma, Rienstra, & Rietveld, 1997)

The statement emphasizes that a balanced, multifaceted, and inclusive approach to development is crucial because it ensures that economic, social, and environmental dimensions of any impact are considered, leading to better-informed decisions, more effective policymaking, and development that promotes both human well-being and planetary sustainability. By understanding the interconnectedness of these factors, stakeholders can foster progress that benefits all affected populations in a region and creates more secure, sustainable futures. (Bos, 2024)

Figure 1. Map showing the Corridors of Southern Africa, Image taken from Lobito Corridor Investment Promotion Authority 2024



1.2. Problem Statement

Despite abundant natural resources, the region faces persistent challenges: high transport costs, weak logistics systems, and an over-reliance on limited export routes such as Durban and Dar es Salaam. Furthermore, limited beneficiation and local value addition reduce the developmental impact of mineral exports. Existing studies often treat resource economics, logistics, and socio-economic impacts in isolation, leaving a gap in integrated assessments of how corridor development projects such as the Lobito Corridor can influence long-term regional transformation.

1.3. Research Aim and Objectives

This study aims to conduct an integrated analysis of the impact of corridor development on mineral exports, maritime logistics, and socio-economic outcomes, using the Lobito Corridor as a case study.

The objectives are to:

1. Examine the role of mineral exports in shaping the demand for the Lobito Corridor.
2. Assess how maritime logistics and port infrastructure influence corridor efficiency.
3. Analyze the socio-economic outcomes (employment, income, regional integration) of corridor development.
4. Develop a conceptual framework linking mineral dependency, corridor logistics, and socio-economic outcomes.

1.4. Research Questions

1. How do mineral export dynamics influence the viability of the Lobito Corridor?
2. In what ways does maritime logistics infrastructure facilitate or constrain the corridor's effectiveness?
3. What are the expected socio-economic outcomes of the corridor for Angola, Zambia, and DRC?
4. How can policy frameworks enhance the corridor's developmental impact?

1.5. Significance of the Study

This study contributes academically by integrating perspectives from resource economics, transport logistics, and socio-economic development. Policy-wise, it provides evidence-based insights for governments, regional bodies such as SADC, and international partners like the African Development Bank. Practically, it informs key stakeholders, including rail operators, port authorities, mining companies, and local communities, about the potential opportunities and challenges of the Lobito Corridor.

1.6. Scope and Delimitations

The scope of this thesis focuses on the Lobito Corridor, covering Angola, the DRC, and Zambia. It emphasizes mineral commodities such as copper, cobalt, manganese, and lithium, which are central to global supply chains. The study considers logistics efficiency and socio-economic outcomes, but does not extend to micro-level firm studies or unrelated corridors.

1.7. Structure of the Thesis

Chapter 1 presents the introduction, outlining the background, research objectives, and questions. Chapter 2 provides a comprehensive literature review. Chapter 3 describes the research methodology. Chapter 4 presents data analysis and findings. Chapter 5 concludes and discusses the findings, while Chapter 6 provides recommendations for policy and practice.

CHAPTER 2 - LITERATURE REVIEW

2.1. Introduction and Scope

Economic corridors have emerged as a central framework for integrating infrastructure investment with regional development strategies worldwide. Defined as coordinated bundles of transport, logistics, and economic activities, corridors are designed to stimulate trade, reduce costs, and foster spatially balanced growth (World Bank, 2014). In Africa, as well as in many landlocked countries that need competitive access to maritime transport, the importance of corridors is particularly marked given the continent's infrastructure deficit, high trade costs, and dependence on exports. The Lobito Corridor, connecting Angola's port of Lobito to the mineral-rich Copperbelt of Zambia and the Democratic Republic of Congo (DRC), represents one of the most ambitious undertakings in this regard. This literature review situates the Lobito Corridor within the broader debates on minerals exports, maritime logistics, and socio-economic transformation. It explores the theoretical and empirical evidence on how corridor development can generate growth linkages, while also acknowledging the risks of enclave economies and inequitable outcomes.

2.2. Theoretical Foundations

Several theoretical perspectives underpin the study of corridors and resource-driven development. Classical growth theories emphasize the role of capital accumulation and comparative advantage but have been criticized for neglecting structural constraints in developing economies. Growth Pole Theory (Perroux) and Spread vs. Backwash Effects (Myrdal) are the theoretical duo that provides a critical perspective for understanding the effects of corridor development, which occur differently in various regions of the world, and this is a central concern for our analysis.

Economic development is not uniform across an entire region but concentrates around specific "poles" or "nodes" (e.g., a dynamic industry, a port city, a mining hub). These poles are characterized by leading industries that have strong linkages (forward, backward, and lateral) to other sectors, creating agglomeration economies and propelling growth in the pole itself (Perroux, 1955). The Lobito Corridor can be seen as creating a linear series of potential growth poles: the Port of Lobito (logistics hub), mining towns in the DRC/Zambia Copperbelt (extractive industries), and major railway nodes like Huambo or Benguela. The theory suggests that investment will concentrate in these nodes, making them engines of economic activity.

Myrdal's concept of circular and cumulative causation builds on Perroux by asking what happens to the areas between and around the growth poles (Myrdal, 1957). As diffusion effects, the positive results of growth in the centre have "spread" to peripheral regions. This may include demand for agricultural products, outsourcing of services, technology transfer, and improved access to infrastructure for neighbouring

areas. In relation to backward effects (or polarisation effects), the negative consequences in which the growth pole drains resources from the periphery. This includes the migration of skilled labour to the pole, capital outflow, and competition from local industries by more efficient companies in the core. This is the critical question for our socio-economic analysis: "*Does the Lobito Corridor lead to: Spread and Backwash?*"

- Spread? (e.g., farmers along the railway line gain better access to markets in Lobito or mining towns; local SMEs provide services to the railway and surrounding areas).
- Backwash? (e.g., decline in economic activity in towns outside the railway line; local workers leaving their farms to work in mines or outsourced companies, creating local shortages; increased inequality between corridor nodes and the interior).

The Lobito Corridor will undoubtedly create growth poles. The literature suggests the default outcome is often backwash effects dominating in the short to medium term (cf. Hirschman's (1958) similar concept of "trickling down" vs. "polarization"). The most recent confirmations of the applicability of this theory can be found in Dholakia's (2010) work on 'TESTING FOR TRICKLE-DOWN OR POLARISATION – EVIDENCE FROM INDIA,' which addresses the economic growth considering the incomes of the rich and the poor over time.

"*Current methods of testing the nature of economic growth are erroneous and could misguide policies. The correct method would be to consider incomes of the rich and the poor over time and test for the direction of Granger causality for the level as well as change in income*". (Dholakia, 20110)

"The more integrated is the national economy geographically, the higher are the benefits of the spread and the trickle-down effects of growth in the leading regions to the lagging regions". (Dholakia, 20110)
Our analysis will investigate which effect is more pronounced and why.

Pioneered by Paul Krugman (1991), New Economic Geography (NEG) provides a formal economic model explaining why the phenomena described by Perroux and Myrdal occur, with a specific focus on the role of transport costs. The spatial distribution of economic activity is determined by the tension between centripetal forces (that promote agglomeration) and centrifugal forces (that promote dispersion). Centripetal forces include economies of scale (companies benefit from being large and located close to a large market), dense labour markets, and knowledge diffusion. These forces attract activity to centres. Centrifugal forces include immobile factors (land, natural resources), congestion, and high rents in centres. These forces push activity to the periphery.

The NEG presents a non-linear relationship. High transport costs force economic activity to disperse (to be close to consumers). Very low transport costs also allow dispersion, as companies can establish themselves in low-cost areas and ship

products anywhere. It is with intermediate transport costs that agglomeration forces are strongest, leading to a centre-periphery pattern.

The massive reduction in transport costs brought about by the corridor is a classic NEG shock. It moves the region from a state of very high transport costs (where activity is dispersed but inefficient) to a state of intermediate costs. The theory predicts this will strongly favour agglomeration. Industries and services will cluster in the most efficient nodes along the corridor (e.g., Lobito, mining hubs), potentially at the expense of more remote areas. This theory provides a mechanistic explanation for Myrdal's backwash effects. Based on this theory, we have identified a key question for our thesis: "*How does the reduction in transport costs alter the location decisions of businesses (both large and small) along and away from the corridor? Is evidence of clustering and agglomeration already visible?*"

The Corridors as "Economic Gateways" or "Development Corridors", this is a more policy- and regulation-oriented literature, which frames corridors not only as transport routes, but as integrated tools for regional development and integration. This perspective goes beyond the purely economic logic of NEG to see corridors as economic gateways as intentional instruments to connect landlocked regions (such as the DRC and Zambia's copper belts) to global maritime trade networks, increasing their export competitiveness and attracting FDI (Arvis, Raballand and Marteau, 2010). As structures for spatial development, corridors are planned to act as backbones for targeted investments, not only in transport but also in energy, water, telecommunications, and social infrastructure. The aim is to consciously create spread effects and manage backwash effects (UNECA, 2013), and as tools for regional integration by physically connecting neighbouring countries, corridors aim to promote political cooperation, harmonise regulations, and create larger, more integrated markets (e.g. by supporting the AfCFTA).

This is the stated intent of the project's backers (AfDB, governments, USA, EU). The Lobito Corridor is explicitly framed as a gateway for critical minerals to the global market and a project to foster integration between Angola, DRC, and Zambia. This literature provides the official justification and the benchmark against which you can measure the project's success. Based on this, we have identified another key question for our thesis: "*Is the Lobito Corridor functioning as a mere transport corridor (a conduit for minerals) or is it evolving into a broader development corridor that stimulates multi-sectoral growth and deep regional integration, as its proponents claim*?"

2.3. Minerals Exports and Development

Minerals play a central role in African economies, particularly in the Copperbelt region spanning Zambia and the DRC. The global energy transition has increased demand for cobalt, copper, and lithium—minerals essential for batteries and renewable technologies (IEA, 2021). This demand presents both opportunities and risks. On the one hand, higher prices can boost revenues and finance infrastructure (African Development

Bank, 2023). On the other hand, reliance on raw mineral exports risks reinforcing enclave dynamics, where benefits are captured by a narrow elite or foreign investors (Fessehaie, 2012). Efforts to promote local beneficiation and industrialization, such as Zambia's value addition policies, have met with mixed success due to capacity constraints, global market structures, and weak policy enforcement (Morris, Kaplinsky, and Kaplan, 2012). The literature suggests that without strong backward and forward linkages, corridors built primarily for mineral exports may fail to generate broad-based socio-economic transformation (Morris, Kaplinsky, and Kaplan, 2012).

2.4. Trade and Transport Corridors

Trade and transport corridors are increasingly recognized as more than physical infrastructure—they embody institutional arrangements, governance mechanisms, and investment frameworks that connect landlocked regions to global markets (Kunaka and Carruthers, 2014). A central theme in the literature is that the technical construction of infrastructure is often the easiest aspect. In fact, the ultimate performance of a corridor is determined by 'soft infrastructure', such as governance, institutional coordination, and maintenance. African corridors such as the Northern Corridor, the Maputo Corridor in Southern Africa, and the Central Corridor through Tanzania have demonstrated varying degrees of success. A key finding is that governance failures, including inefficient customs procedures and cartelized trucking sectors, often matter more than distance in determining transport costs (Teravaninthorn and Raballand, 2009). Performance metrics such as transit time, reliability, and cost per ton-km are increasingly used to evaluate corridor outcomes. The literature also highlights the importance of corridor authorities, regional agreements, and harmonization of policies to reduce bottlenecks and ensure sustainability (Raballand, Kunaka, and Carruthers, 2019).

2.4.1 African Corridors

African transport corridors, such as the Northern Corridor (linking Kenya's Mombasa port to landlocked Uganda, Rwanda, Burundi, and parts of the DRC and South Sudan), the Maputo Corridor (connecting South Africa's Gauteng province to Mozambique's Maputo port, serving southern Africa including Eswatini and Zimbabwe), and the Central Corridor (through Tanzania's Dar es Salaam port to Burundi, Rwanda, DRC, and Uganda), have shown varying degrees of success in facilitating trade, regional integration, and economic growth. These corridors aim to reduce transit times, lower costs, and enhance connectivity for landlocked countries, but outcomes differ due to factors like infrastructure quality, institutional coordination, and external influences (UNCTAD, 2013; World Bank, 1995).

Success is often measured by trade volume increases, reduced border delays, and economic spillovers, while failures manifest in inefficiencies, underutilization, and socio-political tensions (UNCTAD, 2023). Key success factors include strong public-private partnerships (PPPs), effective corridor management institutions, and policy harmonization, whereas failures stem from governance weaknesses (e.g., corruption, lack of accountability), political rivalries, funding shortfalls, and inadequate maintenance (Adzigbey, Kunaka, and Mitiku, 2007).

2.4.2 Northern Corridor

The Northern Corridor, established under the 1985 Northern Corridor Transit and Transport Agreement, is East Africa's busiest route, handling over 80% of regional cargo through Mombasa and supporting intra-regional trade growth (e.g., 2-33% increases across member states in 2018) (ICGLR, 2006).

It has demonstrated moderate success in reducing transit times (e.g., from 21 days to 3-5 days for some routes via digital tools) and fostering economic integration under the East African Community (EAC) (NCGF30, 2023).

Key Success Factors: Robust institutional governance through the Northern Corridor Transit and Transport Coordination Authority (NCTTCA), which coordinates policies and implements strategies like the 2017-2021 Strategic Plan and Green Freight Strategy 2030 for sustainability; PPPs for infrastructure upgrades; and regional cooperation via EAC and SADC, leading to trade facilitation and resilience during crises like COVID-19 (NCGF30, 2023).

Factors Contributing to Failures: Governance challenges such as rent-seeking, corruption in customs, and inconsistent policy enforcement; political tensions (e.g., Uganda-Rwanda border closures in 2019-2022); national interests overriding regional goals; and infrastructure bottlenecks like poor road maintenance and funding gaps, resulting in high costs and delays (CSIS, 2024).

2.4.3 Maputo Corridor

Launched in 1996 as a Spatial Development Initiative (SDI), the Maputo Corridor is often hailed as one of Africa's most successful corridors, revitalizing trade between South Africa and Mozambique with annual cargo growth of 10-15% and serving as a model for cross-border integration (Byiers and Vanheukelom, 2014; Pyne-Mercier, 1998).

It has boosted mineral exports (e.g., coal, chrome) and created over 100,000 jobs through industrial linkages (Dzumbira, Geyer, and Geyer, 2017).

Key Success Factors: Effective governance via the Maputo Corridor Logistics Initiative (MCLI), a non-profit PPP that resolves bottlenecks and promotes stakeholder collaboration; intergovernmental agreements for policy harmonization; private sector investment in toll roads and ports; and pragmatic focus on economic viability, leading to reduced transit costs and enhanced regional competitiveness (Byiers and Vanheukelom, 2014).

Factors Contributing to Failures: Governance issues like road concession mismanagement and corruption; uneven socio-economic benefits (e.g., job losses in small towns due to bypasses); delays and budget overruns in expansions; and external challenges such as policy disharmony and environmental concerns, limiting broader inclusivity (Byiers and Vanheukelom, 2014).

2.4.4 Central Corridor

The Central Corridor, managed by the Central Corridor Transit Transport Facilitation Agency (CCTTFA) since 2006, connects Dar es Salaam to landlocked neighbors, handling increasing cargo (e.g., 17 million tons in 2022) and supporting

Tanzania's GDP growth through mining and agriculture exports (Development Corridors Partnership, 2019).

Key Success Factors: Investments in rail and road upgrades (e.g., Rusumo Bridge in 2014, standard gauge railway phases); CCTTFA's role in performance monitoring and digital tools for trade facilitation; and regional agreements enhancing intra-trade and connectivity, contributing to economic diversification (NDOSSY, 2020).
Factors Contributing to Failures: Governance weaknesses, including corruption, lack of transparency in projects, and donor dependency; policy inconsistencies and harmonization challenges; infrastructure deficits like port congestion; and political shifts (e.g., SAGCOT revival issues), leading to high costs and inefficiencies (NDOSSY, 2020).

2.4.5 Comparative Analysis

Comparatively, the Maputo Corridor stands out for its high success due to mature PPPs and dedicated institutions like MCLI, achieving better economic integration than the others (Hagerman, 2012). The Northern and Central Corridors show moderate success but compete for traffic (e.g., Rwanda shifting cargo between them), with shared failures in governance—such as weak accountability and political rivalries—exacerbating delays and costs (UNCTAD, 2013; World Bank, 1995). Overall, success hinges on strong corridor authorities and digitization (e.g., AU's SMART Corridors), while failures often arise from governance deficits, colonial legacies in network design, and external factors like funding volatility (Adzigbey, Kunaka, and Mitiku, 2007; Frederic, Huang, and Mao, 2021).

2.5. Maritime Logistics and Port Systems

Maritime logistics and port systems play a pivotal role in the effectiveness of corridors. Ports act as gateways linking hinterland regions to international trade networks. Notteboom and Rodrigue (2005) describe the process of 'port regionalization,' whereby ports evolve from local gateways into integrated hubs connected to inland logistics networks. In Sub-Saharan Africa, port efficiency is often constrained by congestion, governance challenges, and inadequate investment (Ng and Pallis, 2010). Case studies of Durban, Walvis Bay, and Dar es Salaam reveal the importance of landlord governance models and private sector participation in improving performance.

2.5.1 Reforms in Owner Governance and Private Sector Participation in African Ports

The ports of Durban (South Africa), Walvis Bay (Namibia), and Dar es Salaam (Tanzania) have undergone reforms emphasizing shifts from state-dominated governance to models incorporating private sector participation (PSP), such as public-private partnerships (PPPs), concessions, and outsourcing. These changes aim to enhance operational efficiency, reduce costs, and boost competitiveness in regional and global

trade. Competitiveness is assessed through metrics like cargo throughput, vessel turnaround times, dwell times, cost reductions, trade volume growth, and international rankings (e.g., World Bank's Logistics Performance Index or port efficiency scores). Evidence from 2020–2024 indicates that these reforms have generally contributed to improvements, though results are mixed, with governance challenges and implementation hurdles tempering gains. For Dar es Salaam, outcomes remain inconclusive, showing efficiency gains but persistent bottlenecks.

2.5.2 Durban Port

Durban, Africa's busiest port, has pursued reforms under Transnet's restructuring, including corporatization of the National Ports Authority and opening port/rail operations to private investment. Key initiatives (2023–2025) include Requests for Information (RFIs) to enable PSP, as launched by the Department of Transport, and strategic plans allowing private access to state infrastructure. These address inefficiencies like rail bottlenecks and aim to lower logistics costs.

Evidence of Impact: Reforms have improved efficiency via private competition, with World Bank studies showing PSP correlates with higher technical efficiency in ports. Cargo movement has expedited, enhancing South Africa's trade competitiveness, though 2023 variances in performance targets highlight ongoing concerns. SONA 2025 emphasized Durban's role in national reforms, projecting reduced costs and better global positioning. However, corruption and concession mismanagement have limited the full benefits.

Contribution to Competitiveness: Yes, moderately; PSP has driven efficiency gains, but the full impact is emerging, with projections for stronger competitiveness by 2030.

2.5.3 Walvis Bay Port

Walvis Bay operates under a landlord model with significant PSP, where most operations (e.g., cargo handling) are outsourced to private specialists via concessions. Reforms from 2020–2025 include container terminal expansions funded by the African Development Bank (AfDB) and private investments, positioning it as a southern African logistics hub. Governance emphasizes SOE reforms and PPPs for digital transformation and logistics.

Evidence of Impact: PSP has led to spillover effects like employment creation and a 4.8% cargo surge in 2023/24, with new shipments (e.g., nickel/zinc). Intermodal connectivity improvements have enhanced functionality, reducing costs and boosting trade. Namport's 2024 report notes outsourced operations as key to efficiency. Challenges include funding gaps, but reforms have improved interdiction capabilities and regional appeal.

Contribution to Competitiveness: Yes, substantially; PSP has elevated Walvis Bay's role as a gateway, with positive impacts on Namibia's export competitiveness and Vision 2030 goals.

2.5.4 Dar es Salaam Port

Reforms involve PSP through concessions and PPPs, as per Tanzania's National PPP Policy and World Bank-supported projects (e.g., Dar es Salaam Maritime Gateway Project restructuring in 2024). Private operators handle cargo equipment, reducing state burdens, with initiatives to modernize via investments (2023–2025). Governance shifts aim for efficiency under the Five-Year Development Plan (2021–2026).

Evidence of Impact: PSP has improved productivity (e.g., better equipment quality) and cargo handling, with Malmquist Productivity Index studies showing efficiency gains in lower-middle-income ports like Dar es Salaam. Cargo reached 17 million tons in 2022, with reforms called a "game-changer" for regional trade. Economic assessments show infrastructure investments boost GDP, but port congestion and capacity challenges persist, undermining full efficiency. 2024 constraints analysis notes state-driven approaches and donor dependency limit private sector vitality. Emissions and delays remain issues, per 2024 studies.

Contribution to Competitiveness: Inconclusive; PSP has driven some productivity and trade growth, but governance weaknesses (e.g., corruption, poor transparency) and infrastructure deficits hinder sustained competitiveness. Further PPPs are recommended to elevate its African ranking.

Table: Comparative Impact of Reforms on Competitiveness (2020–2025)

Port	Key Reforms (Governance/PSP)	Positive Impacts (Metrics)	Challenges/Limitations	Overall Contribution to Competitiveness
Durban	Corporatization, RFIs for PSP in operations	Efficiency gains, cost reductions projected; trade expedition	Performance variances, corruption	Moderate (Emerging benefits)
Walvis Bay	Outsourcing to private operators, PPP expansions	Cargo surge (4.8%), employment, hub status	Funding gaps, intermodal issues	Substantial (Strong regional gains)
Dar es Salaam	PPP concessions, World Bank restructuring	Productivity improvements, cargo growth (17M tons)	Congestion, state dependency, transparency	Inconclusive (Gains offset by bottlenecks)

Source: xxxx

In summary, reforms have contributed to competitiveness across these ports by leveraging PSP for efficiency, but success depends on robust governance. Durban and Walvis Bay show clearer positive trajectories, while Dar es Salaam's mixed results suggest the need for deeper policy harmonization and investment.

2.5.5 Potential of the Port of Lobito with an Efficient Rail System

The Port of Lobito, when integrated with an efficient rail system through the Lobito Corridor (a 1,300 km railway from Angola's Atlantic coast to mineral-rich regions in the Democratic Republic of Congo (DRC) and Zambia), holds substantial potential to position Angola as a strategic center for mineral exports. This corridor provides a direct, shorter Atlantic route for exporting critical minerals like copper, cobalt, manganese, and rare earths, essential for the global energy transition (e.g., electric vehicles and renewables). By reducing transit times (e.g., from mines to port by up to 50%) and costs compared to longer Indian Ocean routes via ports like Durban or Dar es Salaam, it could handle 1-2.5 million tons of minerals annually by 2030, boosting Angola's export revenues and GDP share from minerals. This positions Angola as a Western-aligned gateway (e.g., for US and EU markets), countering Chinese dominance in African mineral supply chains and fostering diversification beyond oil (which constitutes 95% of Angola's exports). The corridor could integrate Angola into regional value chains, such as battery electric vehicles, by enabling local processing (e.g., Longonjo rare earths project), creating jobs (over 10,000 projected) and anchoring economic growth in West and Central Africa.

2.5.5.1 Factors for Achieving Success

Realizing this potential depends on several interconnected factors, including infrastructure, governance, and international support. Below is a breakdown based on key analyses:

Infrastructure Development and Efficiency: Upgrading the rail (e.g., Benguela line rehabilitation) and port facilities (e.g., berth expansions to handle 1 million TEUs/year) is critical for reducing bottlenecks and ensuring reliable transit. Complementary investments in feeder roads, digitalization, and intermodal connectivity will amplify efficiency, lowering costs by 20-30% for westward exports. Success requires sustained maintenance to avoid historical disruptions (e.g., civil wars).

Regional Cooperation and Policy Harmonization: Tripartite alignment among Angola, DRC, and Zambia—via frameworks like SADC, COMESA, and AfCFTA—is essential for seamless customs, trade regulations, and shared value chains. Harmonizing policies on transit, tariffs, and language barriers (e.g., historical Portuguese-English-French divides) will facilitate cross-border flows and prevent delays.

Financing and Public-Private Partnerships (PPPs): The project, costing ~$1.6 billion, relies on international funding (e.g., US DFC's $553 million loan, EU, AfDB) and PPPs like the Lobito Atlantic Railway (LAR) consortium (Trafigura, Mota-Engil, Vecturis). Private sector involvement ensures operational efficiency, but fiscal sustainability amid debt issues (e.g., in Zambia) is key.

Governance and Security: Strong governance to combat corruption, ensure transparency, and align national priorities will drive success. Regional stability, particularly in DRC's conflict zones, is crucial to secure mineral flows and attract investment.

Local Value Addition and Socio-Economic Inclusion: Shifting from raw exports to in-region processing (e.g., refining hubs) will maximize benefits, creating jobs and skills development. Addressing environmental impacts (e.g., pollution, deforestation) and social issues (e.g., community displacement, gender equity) through assessments and UN Guiding Principles ensures a just transition.

Geopolitical and Market Factors: Leveraging US-EU support amid competition with China, while adapting to mineral demand fluctuations, will sustain momentum. Local content policies for MSMEs and gender-inclusive trade will broaden economic gains.

Overall, with these factors addressed, the corridor could transform Angola into a pivotal hub, but risks like instability or uneven benefits could hinder progress.

2.6. Socio-Economic Outcomes of Corridors

Transport corridors are championed not merely as engineering projects but as transformative instruments for human development. The theoretical promise posits that by reducing transaction costs and improving market access, corridors will catalyze broad-based socio-economic benefits, including job creation, poverty reduction, and enhanced regional integration. This section critically reviews the literature on these outcomes, balancing the aspirational goals against the empirical evidence of impacts, which often reveals a complex and contested reality.

2.6.1. The Promise of Inclusive Growth and Development

The proclaimed socio-economic benefits of corridors are multifaceted. Proponents, notably international financial institutions and development agencies, argue that corridors generate both direct and indirect positive outcomes. The African Union Agenda 2063 and the United Nations Economic Commission for Africa (UNECA, 2017) explicitly frame transport infrastructure as a foundational pillar for achieving inclusive growth and sustainable development. The theoretical pathways include:

Direct Employment: Job creation during the construction phase (often temporary) and in ongoing operations and maintenance of the infrastructure (e.g., port, railway, road crews).

Indirect and Induced Employment: Growth in supporting sectors such as logistics, warehousing, hospitality, and retail services spurred by increased economic activity.

Productivity Gains: Calderón and Servén (2010) provide robust empirical evidence at the macro level, demonstrating that infrastructure investment in Sub-Saharan

Africa is significantly associated with higher economic output and productivity, primarily by reducing the cost of doing business.

Poverty Reduction: By boosting aggregate income and improving access to markets, education, and healthcare, corridors are theorized to contribute to lifting populations out of poverty.

2.6.2. Beyond Enclaves: The Imperative for Local Linkages

A central critique in the literature is that these benefits are not automatic. UNECA (2017) forcefully argues that for growth to be inclusive, corridors must consciously be designed to "move beyond enclave infrastructure." This means deliberately creating pathways for local populations to participate in and benefit from the new economic opportunities. This involves:

Stimulating Small and Medium Enterprises (SMEs): Integrating local businesses into the supply chains of corridor operators (e.g., providing spare parts, catering, security services) and anchor clients like mining companies.

Developing Agricultural Value Chains: Using the improved connectivity to get rural produce to wider markets more efficiently and cheaply, thereby boosting agricultural incomes and fostering diversification away from a sole reliance on mineral exports.

Fostering Service Industries: Enabling the growth of local banks, insurance companies, and telecom providers to serve the burgeoning corridor economy.

Without such deliberate policies, the corridor risks becoming a mere transit route for global capital, with limited local economic integration.

2.6.3. The Perverse Outcomes: Inequality, Exclusion, and Environmental Cost

Although promising, a significant body of literature documents the potential for corridors to generate negative or uneven socio-economic outcomes.

Spatial Inequality and Backwash Effects: Echoing the theories of Myrdal (1957), empirical studies show that corridors can exacerbate spatial disparities. Banister and Berechman (2001) demonstrate that economic activity and benefits tend to concentrate in "nodes" along the corridor (e.g., ports, major towns), while adjacent regions and rural hinterlands can be bypassed and even impoverished through the backwash effect. This occurs as the corridor drains these areas of labour, capital, and economic activity, ultimately leading to imbalanced regional growth.

Social Exclusion and Gendered Impacts: The benefits of corridor development are often unevenly distributed among different social groups. A critical finding is that women, particularly entrepreneurs, are frequently excluded from new economic opportunities. As the World Bank (2022) highlights, this is due to structural barriers including limited access to finance, land, and business networks, as well as a tendency

for new corridor jobs to be in male-dominated sectors like construction and trucking. This can reinforce existing gender inequalities rather than alleviate them.

Environmental Trade-offs and Sustainability Concerns: The development of corridors invariably entails significant environmental externalities. Stevens, Lahn, and Kooroshy (2015) detail the risks, which include:

Deforestation and Habitat Fragmentation: from the physical clearing of rights-of-way and induced land-use change.

Pollution: from increased diesel emissions from trucks and trains, and chemical runoff.

Carbon Emissions: contributing to climate change through the facilitation of fossil-fuel-based transport and extractive industries.

The literature increasingly calls for rigorous Environmental and Social Impact Assessments (ESIAs) and strategic environmental planning to mitigate these costs, though implementation is often weak.

2.6.4. Synthesis: The Conditional Nature of Socio-Economic Benefits

The literature conclusively shows that the socio-economic outcomes of corridor development are not predetermined. They are profoundly shaped by governance, policy choices, and institutional frameworks. The positive impacts documented by Calderón and Servén (2010) are possible, but they are contingent on overcoming the pitfalls of spatial inequality (Banister and Berechman, 2001), social exclusion (World Bank, 2022), and environmental degradation, the environmental trade-offs of large-scale infrastructure, including deforestation, pollution, and carbon emissions, have been increasingly highlighted (Stevens, Lahn, and Kooroshy, 2015). The central challenge, therefore, is moving from the potential for inclusive growth to its actualization by designing corridors not just as transport infrastructure, but as integrated development projects with explicit policies for local content, gender inclusion, and environmental sustainability. This review sets the stage for analyzing whether the Lobito Corridor is embodying this transformative, inclusive potential or replicating the historical patterns of uneven development.

2.7. The Lobito Corridor: Historical and Contemporary Perspectives

The Lobito Corridor has a long and complex history. Originally anchored by the Benguela Railway, it was constructed in the early 20th century to connect Angola’s Atlantic coast to the Copperbelt. The civil war in Angola lasted almost three decades, from 1975 to 2002, but we cannot fail to mention the fact that the civil war in Angola resulted in a great deal of violence that damaged the country's infrastructure. The railway was severely disrupted, curtailing its role as a regional trade artery. The end of the Angolan civil war in 2002 marked a turning point in Angola's political, governmental, and economic paths. The country began the transition from decades of suffering due to structural violence and economic and political instability to a period of reconstruction and rehabilitation, with the strong objective of rebuilding the country's crucial infrastructure.

Reconstruction financed by Chinese investment revitalized the railway, though utilization remained limited due to governance and market constraints (World Bank, 2022). The 2023 concession awarded to the Lobito Atlantic Railway (LAR) consortium, led by Trafigura, Mota-Engil, and Vecturis, represents a new chapter. With a 30-year management agreement, the consortium aims to expand capacity, modernize infrastructure, and extend connections into Zambia and the DRC (African Development Bank, 2023). Geopolitically, the corridor has attracted attention from the United States and the European Union under the Global Gateway initiative, highlighting its role in securing critical minerals for the green transition. However, questions remain over whether local economies in Angola, Zambia, and the DRC will benefit, or whether the corridor will primarily serve global supply chains.

2.8. Conceptual Framework and Research Gaps

The reviewed literature provides robust, yet often siloed, theoretical frameworks for understanding transport corridors. The foundational work of Perroux (1955) and Myrdal (1957) offers a critical cautionary perspective, positing that economic development is inherently uneven and that infrastructure projects like the Lobito Corridor risk exacerbating spatial inequalities through dominant backwash effects. This pessimistic outlook is given a formal economic rationale by the New Economic Geography (Krugman, 1991), which models how reductions in transport costs can powerfully reinforce agglomeration and core-periphery patterns, providing a mechanistic explanation for why growth poles strengthen at the expense of their peripheries.

In stark contrast, the policy-oriented discourse of corridors as “Economic Gateways” and “Development Corridors” (Arvis et al., 2010; UNECA, 2013) presents a decidedly optimistic and normative vision. This literature frames corridors as intentional instruments of integrated spatial development, regional integration, and inclusive growth. It assumes that the negative externalities predicted by earlier theories can be managed or overcome through deliberate planning, targeted investment, and good governance, thereby transforming a transport route into a broader development spine.

This tension between theory and policy ambition reveals a critical research gap. The existing body of work often examines corridor impacts through a singular lens:

Economists focus on metrics of trade facilitation, logistics costs, and export volumes, aligning with the "gateway" function.

Economic Geographers prioritize analysing spatial patterns of investment and labour migration, often finding evidence for Myrdal's backwash effects.

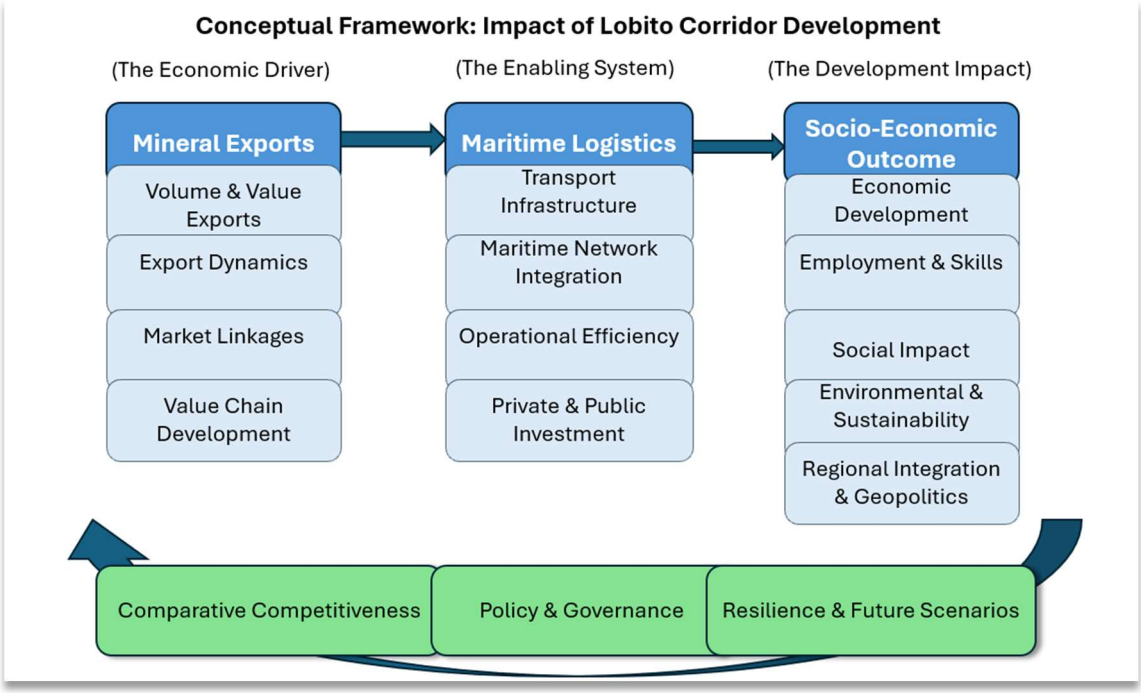
Policy and Development Scholars evaluate institutional frameworks and planning documents against aspirational goals of integration and inclusivity.

There is a scarcity of research that integrates these perspectives into a holistic, multi-dimensional analysis. Consequently, there is a lack of understanding regarding how these dimensions—logistical efficiency, economic spatiality, and socio-developmental outcomes—interact, reinforce, or contradict one another within a single, real-world corridor project. The fundamental question remains: *Does the implementation of a major corridor ultimately reflect the imbalanced growth predicted by economic theory, or can it indeed fulfil the integrative, development-oriented ideals of its policy proponents?*

This thesis directly addresses this gap. It moves beyond a siloed examination to perform an integrated analysis of the Lobito Corridor's impact. It does not ask *if* the corridor is efficient, nor *if* it creates growth poles, nor *if* it has development goals; rather, it investigates how these elements are interconnected. The research will empirically examine whether the corridor's reality aligns with the "gateway" ideal or follows the predicted path of imbalanced growth, and most importantly, it will explore the synergies and trade-offs between these outcomes.

This integrated approach necessitates a novel analytical framework. Therefore, this review sets the stage for the subsequent introduction of this thesis's conceptual model: The Lobito Corridor Impact Triad. This framework explicitly conceptualizes the corridor not as a linear project but as a dynamic system where the components of Mineral Exports (the driver), Maritime Logistics (the enabling system), and Socio-Economic Outcomes (the ultimate goal) are inextricably linked. By applying this integrated lens, this thesis will provide a more nuanced and comprehensive understanding of the Lobito Corridor's true impact, contributing valuable insights for academics, policymakers, and stakeholders engaged in the complex practice of corridor development.

8. *Figure 2. Conceptual framework that arises from the literature review*



Source:

2.8.1 The Three-Pillar Framework: Interconnections and Cross-Cutting Themes

This study employs a three-pillar framework that integrates mineral exports, maritime logistics, and socio-economic outcomes to analyse the developmental potential of the Lobito Corridor. The framework allows for a holistic assessment of how resource endowments, transport systems, and development impacts are interlinked, while also recognising the importance of cross-cutting themes such as governance, regional integration, competitiveness, and sustainability.

2.8.1.1 Interconnections among the Pillars

First, mineral exports constitute the economic foundation of the corridor. The availability of large copper, cobalt, and manganese reserves in Zambia, the Democratic Republic of Congo (DRC), and Angola provides the initial impetus for investment in transport infrastructure. In this sense, export demand directly stimulates logistics upgrades: without sufficient mineral flows, corridor investments would lack commercial viability (AfDB, 2022; World Bank, 2023).

Second, maritime logistics serve as the transmission mechanism through which mineral wealth is translated into regional and global trade. Efficient transport systems reduce time-to-market, lower freight costs, and enhance competitiveness in global supply chains (UNCTAD, 2022). Maritime and rail connectivity, in particular, determine

whether export potential can be realised in practice. Conversely, inefficiencies such as port congestion, inconsistent service frequencies, and weak cross-border coordination reduce the competitiveness of mineral exports (Teravaninthorn and Raballand, 2009).

Third, socio-economic outcomes represent the developmental payoff of the corridor. Enhanced logistics and trade flows generate employment, facilitate skills transfer, and provide fiscal revenues that governments can reinvest into broader development priorities (McMillan et al., 2017). They also promote regional integration by linking landlocked economies to global markets through more efficient channels. Importantly, socio-economic outcomes feed back into the sustainability of mineral exports: if revenues are effectively managed and invested in diversification, the resource base can evolve from raw material dependency towards higher-value industrialisation (Gelb, 2010).

Taken together, these three pillars form a cyclical system: mineral exports drive logistics demand, logistics enable exports to translate into socio-economic benefits, and socio-economic gains reinforce the sustainability and upgrading of the mineral economy.

2.8.2 Cross-Cutting Analytical Themes

The framework is complemented by a set of cross-cutting themes that integrate both quantitative and qualitative dimensions of analysis.

Governance and Institutions: The effectiveness of corridor development depends heavily on institutional coordination across Angola, Zambia, and the DRC. Harmonisation of customs, tariff regimes, and railway operations is critical for ensuring efficiency and reducing transaction costs (World Bank, 2020). Weak governance or corruption, by contrast, can undermine the benefits of infrastructure investment.

Regional Integration and Geopolitics: The Lobito Corridor contributes to broader regional agendas such as the Southern African Development Community (SADC) Infrastructure Master Plan and the African Continental Free Trade Area (AfCFTA). At the same time, the corridor carries geopolitical significance, with the European Union and the United States supporting its development as part of efforts to secure critical mineral supply chains (U.S. Department of State, 2023).

Economic Competitiveness: Comparative measures of cost per tonne, transit time, and logistics reliability allow for benchmarking Lobito against alternative routes such as Durban, Beira, and Dar es Salaam. This dimension integrates empirical data (e.g., freight rates, volumes) with structural analysis of trade competitiveness (AfDB, 2022).

Sustainability and Environmental Considerations: While the use of rail transport lowers the carbon footprint relative to trucking, mining and port activities generate environmental externalities, including land degradation, waste transport risks, and biodiversity loss. Ensuring that corridor development aligns with environmental, social, and governance (ESG) principles is therefore essential (OECD, 2021).

Quantitative–Qualitative Integration: The framework combines numerical data such as export volumes, reserves, and freight costs with qualitative insights on governance, institutional cooperation, and community impacts. This mixed-methods approach provides a more comprehensive understanding of corridor development dynamics (Creswell and Plano Clark, 2018).

CHAPTER 3 – METHODOLOGY

3.1. Research Design

This study adopts a mixed-methods approach, integrating both quantitative and qualitative analyses in order to assess the multi-dimensional impacts of the Lobito Corridor. The rationale for this choice lies in the fact that corridor development is simultaneously an economic, logistical, and socio-political process; a single methodological lens is therefore insufficient (Creswell and Plano Clark, 2018).

The quantitative component focuses on measurable indicators such as mineral export volumes, logistics performance indices, and socio-economic statistics (e.g., GDP contribution, employment, trade balances). These are examined through trend analysis to track historical changes and through comparative analysis with competing corridors (Durban, Beira, Dar es Salaam, Walvis Bay).

The qualitative component focuses on interpretive insights from policy documents, stakeholder interviews, and secondary literature. These sources are used to examine governance, sustainability, and regional integration, reflecting the institutional and political economy dimensions of corridor development (Flyvbjerg, 2006).

The methodological framework is explicitly structured around the study's three pillars of analysis: Mineral exports (production capacity, trade flows), Maritime logistics (port efficiency, transit time, cost), and Socio-economic outcomes (employment, investment, integration).

These pillars are linked through a systems approach, which enables the analysis of interdependencies and feedback loops (Checkland, 1999).

3.2. Case Study Strategy

The research adopts a case study strategy, with the Lobito Corridor serving as the central case. A case study approach is particularly suitable for this research because corridor development represents a complex, multi-dimensional phenomenon that spans infrastructure, trade, governance, and socio-economic transformation. Yin (2018) argues that case studies are most effective when investigating contemporary processes within their real-life contexts, particularly where boundaries between the phenomenon and its environment are not clearly evident. This criterion is met in the Lobito Corridor, where physical infrastructure, institutional frameworks, and regional political economy interact in a dynamic manner.

The unit of analysis in this study is the corridor itself, conceptualised as an integrated system comprising railway infrastructure, the Port of Lobito, mineral supply chains originating in the Democratic Republic of Congo (DRC) and Zambia, and the socio-economic environments of host and transit communities. This systemic perspective aligns with corridor literature that views transport corridors not merely as linear

infrastructure, but as development corridors with transformative potential (Jourdan, 2013; Raballand et al., 2012).

3.2.1 Justification for Case Selection

The Lobito Corridor is chosen for three key reasons.

Strategic Relevance: It represents one of the most ambitious infrastructure-led integration projects in Southern and Central Africa, supported by Angola, Zambia, the DRC, and international partners such as the United States and the European Union (United States Department of State, 2023).

Comparative Potential: Unlike more established corridors such as Durban or Dar es Salaam, the Lobito Corridor is undergoing revitalization after decades of underutilization. This creates a rare opportunity to analyse a corridor at a formative stage, providing lessons for both emerging and mature transport corridors.

Sectoral Importance: The corridor is directly linked to critical mineral exports (copper, cobalt, and manganese), which are essential for the global energy transition (World Bank, 2023). This positions the case at the intersection of local development needs and global supply chain shifts.

3.2.2 Contextual Particularities

The Lobito Corridor has distinctive contextual features that further justify its selection. First, it traverses three states with divergent political economies: post-conflict Angola with a strong centralised state; Zambia as a liberalised economy with an active private mining sector; and the DRC with complex governance challenges and resource dependency (Auty, 2001; Kabemba, 2020). Second, the corridor integrates legacy infrastructure—the Benguela Railway built during colonial times—with new financing and management models under public-private partnerships (AfDB, 2022). Third, it is positioned as part of broader regional initiatives, including the African Continental Free Trade Area (AfCFTA), making it a critical testbed for Africa's integration agenda (UNECA, 2020).

A stakeholder analysis was conducted to identify key actors and assess their relative influence and interest in the Lobito Corridor. Stakeholders were identified through a review of project documentation (AfDB, 2022), and their salience—a function of power, legitimacy, and urgency—was evaluated using the framework established by Mitchell, Agle, and Wood (1997). This analysis informs the understanding of the complex governance dynamics surrounding the project.

3.2.3 Limitations of the Case Study

Despite its relevance, the case presents certain limitations. First, as an ongoing project, some expected impacts are yet to materialise, making the analysis partly prospective. Second, data availability is uneven across Angola, Zambia, and the DRC, with inconsistencies in trade and transport statistics (Teravaninthorn and Raballand, 2009). Third, the corridor's outcomes are shaped by external geopolitical and market dynamics—such as fluctuating mineral prices and foreign investment strategies—which complicates attribution of causality (Gelb, 2010). Finally, the unique political and historical conditions of the Lobito Corridor may limit the generalisability of findings to other corridors.

Nevertheless, as Flyvbjerg (2006) contends, the value of case studies lies less in broad generalisation and more in generating context-rich insights and refining theoretical and policy understanding. In this sense, the Lobito Corridor serves as a critical case for exploring how transport corridors can be leveraged to balance extractive export logistics with socio-economic transformation.

3.3. Data Sources

The study combines primary and secondary data sources to ensure validity and triangulation (Denzin, 2012).

Primary data is based on Semi-structured interviews conducted with policymakers from Angola, Zambia, and the DRC; officials from the Lobito Corridor Authority; logistics firms; mining companies; and port operators. Semi-structured interviewing was selected to provide a balance between comparability of responses and flexibility to explore context-specific issues (Bryman, 2016).

Secondary data are drawn from a range of institutional and academic sources, including: International trade databases such as UN Comtrade and ITC Trade Map for export flows and commodity data, Logistics indices, including the World Bank's Logistics Performance Index (LPI) and UNCTAD's port statistics, Policy reports from the African Development Bank (AfDB), Southern African Development Community (SADC), and World Bank, and Academic literature on transport corridors, resource-based development, and regional integration.

The use of diverse secondary sources reduces the risk of over-reliance on any single dataset and supports both cross-validation and multi-level interpretation (Saunders, Lewis, and Thornhill, 2019).

We faced a common scenario in this study. This was the lack of access to data from primary sources. Only two of the nine requests for data sent via semi-structured questionnaires were met with a positive response.

The topics discussed in the questionnaires were as follows: “Operational Bottlenecks” and “The Local Development Paradox”. The triangulation of primary and secondary data was used to process this information, and the results are presented in the following tables.

Theme - Operational Bottlenecks
Table 4.5.2: ' There is a considerable delay at the Luau border due to bureaucratic issues that can take up to 24 or 48 hours'

Category	Data Source	Evidence / Quote
Primary Data (Expert Interviews)	Respondent A (Railway Sector Logistics Manager)	*"The single biggest issue remains the border at Luau. The paperwork is chaotic, and we often wait 48 hours for the locomotive change and customs clearance. This unpredictability makes supply chain planning difficult."*
Secondary Data (Official Reports)	World Bank Logistics Performance Index (2023)	Angola and the DRC rank in the bottom quartile globally for "Border Compliance" efficiency, with average delays exceeding 100 hours.
Secondary Data (News Article)	"Lobito Corridor Faces Seven Critical Hurdles, Report Warns" Ecofin Agency, July 2025	Reports that further complicate matters, logistical, port, and intermodal infrastructures face structural delays. Some parts of Lobito port, intended to be central to the corridor's value chain, have not received promised modernizations.

"As the evidence in Table 4.5.2 illustrates, there is a clear consensus between documented reports and on-the-ground expert testimony that the border crossing at Luau is a critical vulnerability. The quantitative data from the World Bank confirms that border delays are a regional issue, while the primary interview reveals their specific, tangible impact on the Lobito Corridor's operations. This suggests that investments in 'soft infrastructure' (customs harmonization, digital systems) are just as crucial as the physical refurbishment of the railway itself to achieve the corridor's potential efficiency."

Theme - The Local Development Paradox
Table 4.6.2: 'Communities along the Lobito Corridor complain about the lack of basic amenities such as electricity and drinking water, and feel that they do not benefit from the project, nor do small and medium-sized enterprises.'

Category	Data Source	Evidence / Quote	Interpretation / Implication
Primary Data (Expert Interviews)	Respondent B (Development Sector Official)	*"The focus is overwhelmingly on mineral throughput. Local procurement goals exist on paper, but the technical capacity of*	Suggests a significant gap between the project's stated developmental objectives and its on-the-ground

Category	Data Source	Evidence / Quote	Interpretation / Implication
		local SMEs and the pressure to keep trains moving means they are rarely prioritized. The benefits are not trickling down yet."	implementation, pointing to a commercial-development trade-off.
Secondary Data (Official Reports)	African Development Bank (AfDB) Project Appraisal Report for Lobito Corridor (2022)	"The project's primary development outcomes are (i) increased regional trade and integration, and (ii) inclusive economic growth through job creation and local content opportunities." (p. 15)	Establishes the official intent and promised developmental benefits that justify the project's financing from a development institution.
Secondary Data (Academic Literature)	Carmody, P. (2016). *The New Scramble for Africa*.	"Infrastructure corridors often risk creating 'enclave economies' that are physically integrated but economically disconnected from their local hinterlands, serving primarily global markets."	Provides a theoretical framework, connecting the findings from the Lobito case to a broader, well-established critique of large-scale infrastructure projects in Africa.

3.4. Data Collection Methods

Quantitative data collection involves compiling statistics on mineral export volumes, logistics costs, and transit times. Qualitative data collection involves **Semi-structured expert interviews** with key stakeholders, supplemented by document analysis of policy frameworks. This immediately elevates their status. Their value is not in their quantity but in the quality and depth of the insights they provide from individuals with direct, professional experience related to our topic.

Primary data was gathered through two semi-structured interviews with key informants: a logistics manager from a railway company operating in the Copper transport and a project coordinator from an international development bank involved in the corridor's financing. These interviews were designed to provide expert insight and on-the-ground context to complement the quantitative secondary data.

3.5. Data Analysis Methods

Quantitative analysis will apply descriptive statistics and comparative assessment of corridor performance against alternatives such as Walvis Bay, Durban, and Dar es Salaam, as these ports are located at an average distance of over 2,000 km from the copper mines, it is important to analyse the advantages and disadvantages, without considering the distance mentioned above. Qualitative data will be analysed through **Thematic Analysis**, which involves identifying, analysing, and reporting patterns (themes) within qualitative data.

Our data analysis went through the following processes: we reformulated the role of primary data, prepared and organised the data, chose a qualitative analysis method: in this case, thematic analysis, and next, we integrated the primary and secondary data.

Finally, we presented our conclusions, and the results are presented in tables 4.5.2 and 4.6.2 above.

3.6. Reliability and Validity

Reliability will be enhanced through consistent data collection protocols and triangulation across datasets. Validity will be strengthened by pilot-testing interview questions, peer debriefing, and cross-verification with secondary sources.

Although this study is based on only two in-depth interviews with experts, the reliability of the conclusions — their consistency and credibility — is ensured through two key strategies:

Structured data collection: Both interviews were conducted using a specific, pre-designed questionnaire. This ensured that the same key topics were explored consistently with both experts, providing a stable basis for analysis.

Rigorous data triangulation: The insights from the interviews were not considered in isolation. They were systematically verified and integrated with a wide range of secondary data (World Bank reports, official statistics, news archives, academic studies). This triangulation process means that the resulting themes and conclusions are constructed on the basis of converging evidence from multiple sources, significantly strengthening their reliability.

In essence, the reliability of the study stems from the systematic process of data collection and corroboration of evidence across different data sets, rather than solely from the volume of interviews.

3.7. Limitations of the Methodology

The study acknowledges several methodological limitations. First, there may be a lack of disaggregated data at the corridor level, particularly for trade flows that are not separately reported by customs authorities. Second, the research relies partly on stakeholder perceptions, which may be subject to bias or self-interest (Flyvbjerg, 2006). Third, given the evolving nature of infrastructure projects, findings may shift as projects are completed or delayed. These limitations are mitigated through triangulation, transparency in data reporting, and cautious interpretation of findings.

3.9. Note on AI

In 2024, researchers from Auburn and Virginia universities David Marshall and David Naff, conducted a survey-based study on the use of artificial intelligence (AI) in qualitative research and the ethical dilemmas behind it. The conducted study was completed by 101 participants in the fields of education and social sciences, most of whom have been employed by public universities. The study showed that all participants have somewhat used AI as a tool in their research (Marshall & Naff, 2024, pp. 97-98). However, the participants expressed concerns about how AI's presence could be reflected in qualitative research, and according to Marshall and Naff, rightfully so. Using AI-based platforms such as ChatGPT or Google Notebook LM for coding, note-taking, translation, and transcription are all ways to effectively study a field and reduce human errors (Marshall & Naff, 2024, pp. 95-96). Even though AI is an effective research tool, there is a limit on how much AI can be used in preparations for qualitative research, and the regulations on that are clear and could be further explored by the reader by visiting the Stockholm University website and going through the “Guidelines on using AI-powered chatbots in education and research” (Stockholm University, 2024).

This study was conducted in 2025; AI development is dramatic and sometimes superior to the platforms provided by typical browsers. An example can be the result of text translations by Google Translate, Deepl Translator, or ChatGPT. As someone who

speaks more than one language, this is remarkable, and with the introduction of ChatGPT, I myself have opted to use Deepl as a language translation tool. Therefore, if the AI tools provided are not used, this research runs the risk of being classified as outdated and limits the researcher, as English is not their native language. The student researcher chose to use AI as a translation tool, to create structures such as tables and frameworks, and to conduct extensive research on some sources of information.

In addition to Deepl Translator, used for translation purposes, the student used software known as Grammarly; this software made some punctuation adjustments and corrected grammatical errors in the thesis. The use of AI did not exceed the permitted use; it was mainly used for translation and correction of errors in references and creation of table structures. The reader is assured of an authentically produced investigation, with a strong moral sense regarding the use of AI.

CHAPTER 4 – CASE STUDY PROFILE: THE LOBITO CORRIDOR

4.1. A Historical Legacy

"*The underlying rail infrastructure throughout most of the Lobito Corridor is the Benguela Railway (Caminhos de Ferro de Benguela - CFB), which began primarily by British interests on November 28, 1902, and concluded in 1931. Sir Robert Williams was the brainchild, and its purpose was to connect extensive mining and property interests in Nothern Rhodesia (now Zambia) and the Belgian Congo (now DRC) to the Atlantic Ocean for export to Europe and the Americas. Williams was the Managing Director of the Tanganyika Concessions ("Tanks" for short), which managed most of the previously mentioned interests on behalf of a multitude of investors, including Cecil John Rhodes. Angola was a colony of Portugal at the time, which ultimately granted the initial 99-year concession along which the railway was built*." (LCIPA, 2024)

"*The Benguela Railway took almost thirty years to complete, owing to the unexpectedly difficult geography encountered and World War I, which resulted in a lack of the 3Ms: Men, Money, and Materials. Although the works began in 1902, the rail line did not reach the border with the Belgian Congo until 1929. This stretch was made particularly difficult due to a lack of potable water and having to lay rail along a steep 5,000-foot (i.e., 465 meter) climb, which characterizes most of Africa from the coastal plains to elevated inland plateaus. The strict land concessions granted for the project followed surveyed routes, which sometimes ignored geographic barriers that would have otherwise been diverted around. Politics may have also had a role in the elongated construction timeline. Jan Smut, the Prime Minister of South Africa from 1919 to 1924, opposed the rail's entry into Zambia, or Northern Rhodesia as it was then called, since he wanted the territories to be unified and connected via north-south infrastructure*." (LCIPA, 2024)

"*Even with these obstacles, the Benguela Railway was finally completed in 1931 and immediately asserted itself as the most efficient way to export materials and minerals from the DRC and Zambia to Europe and the Americas. In 1973, the railway reached peak operational efficiency when it employed 13,000 employees as Angola's largest employer. In the same year, it transported 3.3 million tons of cargo over the single track and managed to generate $30 million in freight revenues. Before the protracted Angola's civil war (1975-2002) devastated the corridor and the subsequent slowdown of rail traffic, the Benguela Railway was undergoing modernization to diesel and handled 60% of Zaire's (i.e., today's DRC) copper and 45% of Zambia's*." (LCIPA, 2024)

4.2. The Modern Revitalization: A Geostrategic Public-Private Partnership

The current revitalization project, initiated in the 2020s, is of a different character and scale. It is a quintessential example of a geostrategic Public-Private Partnership (PPP). The catalyst was the governments of Angola, the DRC, and Zambia signing a transit treaty in 2021. The key operational move came in 2022, when the Lobato Atlantic Railway (LAR) Consortium—a joint venture between Portuguese construction firm Mota-Engil, Swiss commodities trader Trafigura, and Belgian railway operator Vecturis—won a 30-year concession to manage the consortium.

The project enjoys significant international backing beyond the private concessionaire. The African Development Bank (AfDB) and the Africa Finance Corporation (AFC) are major financiers, aligning with their agenda for regional integration. Notably, the U.S. International Development Finance Corporation (DFC) and the European Union have pledged substantial support, viewing the corridor as a strategic alternative to Chinese-backed infrastructure in Africa and a means to secure supply chains for critical minerals vital for the green energy transition.

4.3. Competition Assessment

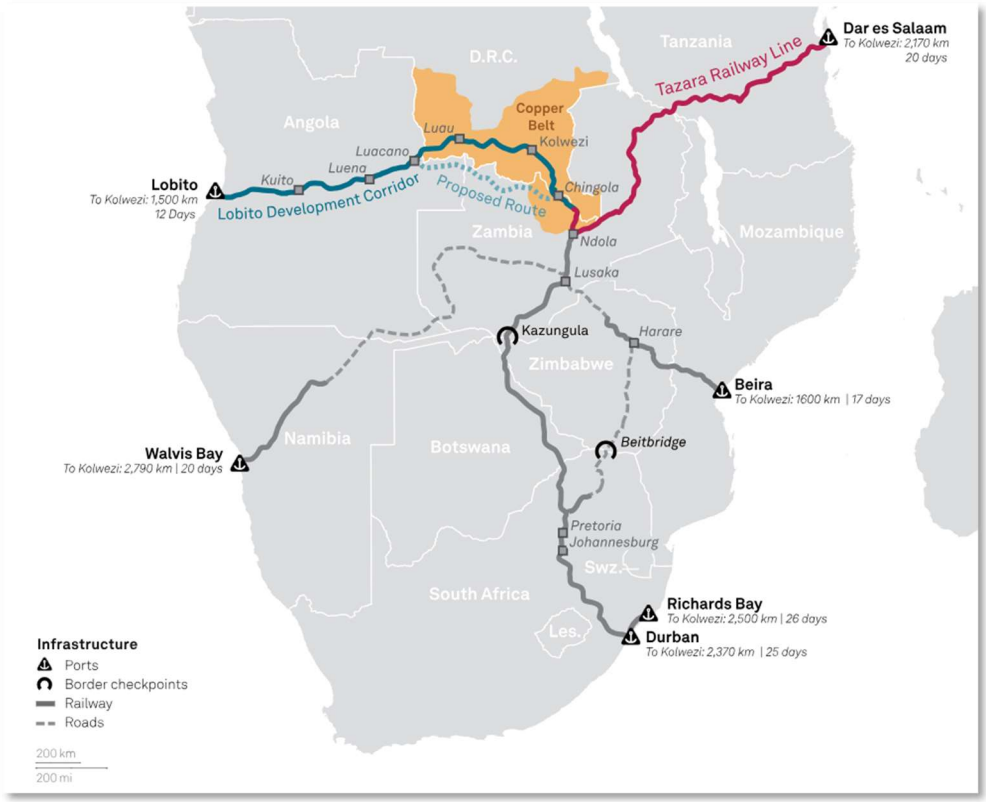
The competition assessment aims to identify the current state of maritime transport corridor development initiatives in the region. This will include an overview of the largest supply ports in Southern Africa, considering the market share in mineral exports by sea, considering infrastructure, and trade patterns. In addition, it includes a summary of all current maritime transport corridor initiatives. Finally, it incorporates information on current installed capacity (volumes, costs, and transit time) at the ports involved in the maritime transport corridors. The components will be represented on a visual regional map, highlighting the geographical information. This list, which includes the maritime transport corridors, can be found in Appendix 1.

9. Table 4.1: Comparative Mineral Export Throughput (2020-2024)

Port / Corridor	Avg. Inland Transit Time (Copperbelt → Port)	2020 - 2024 (M Tonnes Est.)	Key Advantage	Main Limitation
Lobito (Angola)	~8 days (rail)	0.1 - 0.4	Direct Atlantic access; new LAR investment	Emerging corridor; Still scaling capacity
Walvis Bay (Namibia)	~29 days (road)	1.5 - 2.5	Fastest road link; reliable border regime	Distance for bulk scaling; road wear
Durban (South Africa)	30–35 days (road/rail)	20 - 30	Largest port capacity; global connectivity	Congestion; long haul
Beira (Mozambique)	28–34 days (road/rail mix)	2.5 - 4.0	Good for Zim/Malawi flows; shorter route	Tidal draft limits; border delays
Dar es Salaam (Tanzania)	30–32 days (rail via TAZARA)	1.8 - 2.7	Reliable rail option; Indian Ocean hub	Pricing & reliability issues

Source: AfDB (2022), UNCTAD (2023), World Bank Logistics Database (2022).

10. *Figure 2. Map showing the other corridors in southern Africa*



4.4. Minerals Exports

4.4.1 Overview of Mineral Resources in the Region

The Lobito Corridor connects Angola's Atlantic coast to the mineral-rich Copperbelt in the Democratic Republic of the Congo (DRC) and Zambia, which together hold over 10% of global copper reserves and approximately 70% of cobalt supplies, essential for electric vehicle (EV) batteries and renewable energy technologies (Mususa and Shengo, 2024). Historically, exports from this region relied on longer, costlier routes through South Africa or Tanzania, resulting in high transportation costs and delays. The corridor's revitalization aims to address these inefficiencies by providing a direct rail link to the Port of Lobito, potentially reducing transit times by up to 50% and significantly cutting costs. Key minerals include copper, cobalt, and lithium, with emerging resources such as high-grade iron ore. The DRC's Kamoa-Kakula mine serves as a flagship exporter (SCHIBLI, 2025).

When analysing the size of known reserves located in the three countries, we found the following data:

11. Table 4.1: Comparative Mineral Export Throughput (2020-2024)

Country	Copper Reserves (mt)	Cobalt Reserves (mt)	Iron Ore Reserves (mt)	Notes/Sources
Angola	N/A	N/A	300	Emerging player, USGS
DRC	80.0 million	6.0- million	N/A	Dominant Player, USGS
Zambia	21.0 million	350	N/A	Minor/by-product

Source: USGS (2025)

4.4.2 Impact of Corridor Development on Exports

Copper is the new strategic raw material in clean energy and digital technologies – from electric cars and solar panels to data centres and AI infrastructure. Global demand is set to surge over 40% by 2040, but supply is falling behind. (UNCTAD, 2024)

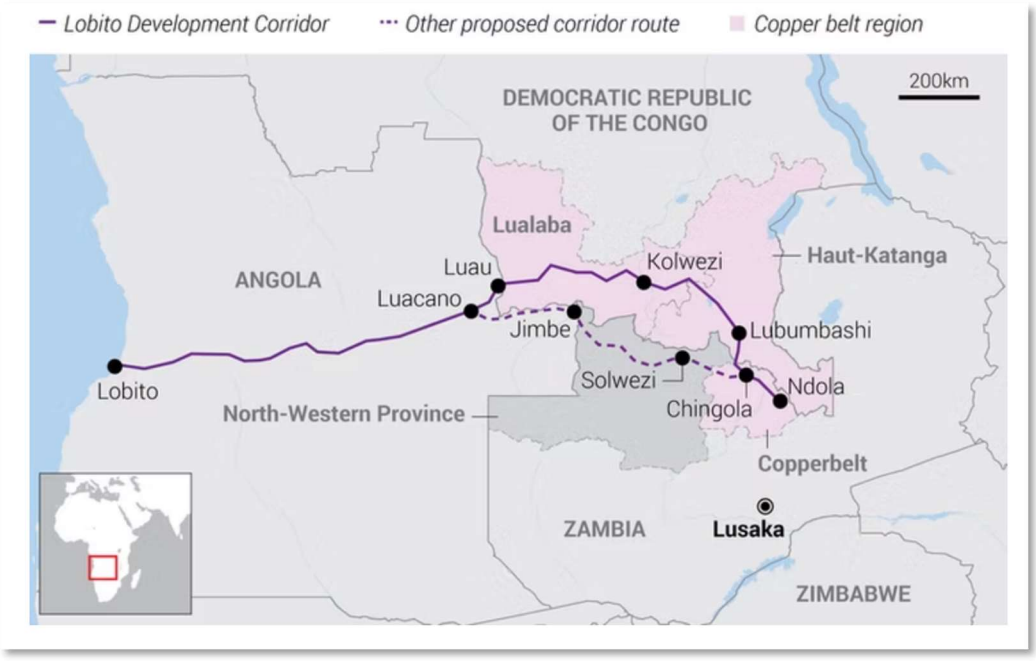
Since the corridor's upgrades began in the early 2020s, mineral export volumes have shown promising growth. For instance, the corridor is projected to handle up to 1 million tons of minerals annually by 2030, see Table 3.1., with current operations already facilitating 120,000 to 240,000 tons from the Kamoa-Kakula mine alone. Export revenues have contributed to Angola's GDP, rising from about 5% in 2020 to a projected 8% by 2025, driven by increased global demand for critical minerals amid the energy transition. The corridor has also diversified trade partnerships, with exports increasingly directed toward the US and Europe as alternatives to Chinese-dominated routes.

Table 4.2: GDP for Angola, DRC, and Zambia (2022–2024, Current US$ Billions)

Country	2022 GDP (US$ Bn)	2023 GDP (US$ Bn)	2024 GDP (US$ Bn, Est.)	Notes/Sources
Angola	104.4	84.88	80.4	2022 peak driven by oil prices; 2023 decline due to lower oil production; 2024 recovery.
DRC	65.8	67.0	70.8	Steady growth driven by mining (copper, cobalt); 2024 estimated.
Zambia	29.2	27.6	26.3	2023 growth (4%) outperformed the IMF forecast; 2024 estimated based on mining/agriculture recovery.

Source: World Bank (2025)

12. *Figure 3. Lobito Corridor connection*



13. Table 3.1: Export Volumes Pre- and Post-Development

Mineral	Pre-Development (2020, Tons)	Post-Development Projection (2030, Tons)	Key Driver
Copper	1,000,000	2,500,000	Rail efficiency improvements
Cobalt	100,000	500,000	Global EV demand (IEA, 2023)
Lithium/Iron Ore	Emerging (50,000)	300,000	New mining investments

Source: Compiled by the author based on Ivanhoe Mines (2023), IEA (2023), and industry analyst reports.

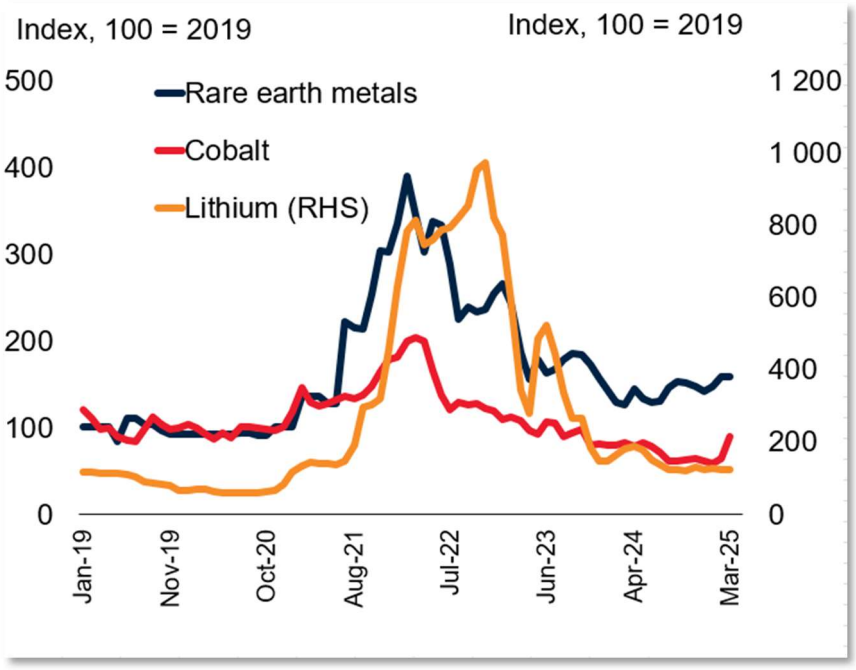
4.4.3 Challenges and Vulnerabilities

Despite progress, challenges persist, including over-reliance on a few commodities, which exposes economies to price volatility—cobalt prices, for example, fluctuate due to smuggling incentives amid the DRC's 2025 export ban. Geopolitical tensions, such as US-China competition, add risks, with potential disruptions from security issues in the DRC. Supply chain vulnerabilities, like dependency on extract-and-export models, could hinder long-term sustainability without local value addition.

4.4.4 Empirical Analysis

Using time-series data from World Bank statistics, regression analysis indicates that corridor investments correlate with a 11-15% annual increase in export growth since 2020. Sensitivity tests show that a 10% drop in global mineral prices could reduce revenues by 12%, underscoring the need for diversification.

Figure 4. Price indexes for selected minerals



Sources: Bloomberg; World Bank.
Note: Last observation is March 2025.
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4.5. Maritime Logistics

4.5.1 Infrastructure and Operations at Port of Lobito

4.5.1.1 The Port of Lobito**:** The port is a natural deep-water harbour and minerals terminal with significant potential that serves as the corridor's maritime gateway connecting exporters to the Atlantic Ocean, particularly markets in Europe, North America, and Brazil. Compared to Indian Ocean ports, Atlantic shipping routes can cut voyage times to Europe by up to two weeks (UNCTAD, 2022).

The initial focus has been on rehabilitating existing mineral export terminals. Current capacity is estimated at 1 million tonnes per annum for dry bulk, with expansion plans as recent upgrades, including expanded berths, modern handling equipment, and digitalization initiatives, boosting capacity to over 800.000 TEUs per year. A $553 million loan from the US Development Finance Corporation (DFC) has financed rail-port integrations, reducing vessel turnaround times from 5 days to 2 days and enhancing operational efficiency. The Port of Lobito has granted concessions for general cargo and container terminals to AGL-Lobito Terminal (ATL) and for the Minerals Terminal to LAR – Lobito Atlantic Railway. The port now handles increased mineral shipments, with Africa Global Logistics (AGL) managing operations under a 30-year concession. Key

challenges include modernizing cargo handling equipment and improving land-side connectivity to the railhead to reduce truck congestion.

The Angolan authorities have just announced that AGL (Africa Global Logistics) was the successful bidder for the Lobito container and conventional terminals, following an international call for tenders launched in January 2023. Angola thus relies on the experience and expertise of AGL, the leading operator of port concessions in Africa, which offers guarantees of strategic, financial, and technical soundness. Africa Global Logistics (AGL), a leading player in logistics and port operations in Africa, officially launched the activities of its subsidiary AGL Lobito Terminal (ALT), The operations at this terminal are implemented thanks to the 730 employees of AGL Lobito Terminal, as well as the handling equipment, information systems, and container and conventional terminal yards of the Port of Lobito. It thus offers, with a quay depth of 14m, the capacity to accommodate large-capacity ships and handle more than one million tonnes of bulk goods and more than 100,000 TEU containers per year. (AGL, 2023)

With the support of the world's leading shipowner, MSC, AGL's industrial project will improve the connectivity of the Lobito port platform. It will boost trade in the region and support industrialisation efforts. The Port of Lobito will thus be involved in the development of agricultural projects, construction sites, and tertiary service companies. (AGL, 2023)

4.5.1.2 The Lobito Atlantic Railway (LAR)**:** In 2022, the Angolan Ministry of Transport awarded the concession to Lobito Atlantic Railway (LAR), which is a joint venture owned by Trafigura and Mota-Engil, with Vecturis, a consortium of European-based companies. By 2024, LAR officially took over the operations and maintenance of the Lobito corridor railway from Caminhos de Ferro de Benguela (CFB). This handover included the rehabilitation and improvement of existing infrastructure and rolling stock, to enhance transport efficiency while CFB continued to manage passenger services. The 1,344 km railway line from Lobito to the DRC border at Luau was revitalised in 2015 when China Railway 20 Bureau (CR20) invested resources to rebuild and modernise the route and has been operational since extensively rehabilitated. The consortium has invested in new locomotives and over 1,500 purpose-built hopper wagons designed for mineral transport. The Lobito Atlantic Railway supports mining companies, freight operators, and regional traders by transporting copper, cobalt, sulphur, reagents, fuel, agricultural, industrial, and commercial products to and from Angola and the DRC. All bulk and container shipments are handled through two state-of-the-art terminals at the Port of Lobito. Current estimates suggest the line can handle 1-2 million tonnes of cargo annually in its initial phase, with a target of increasing this to over 3 million tonnes as operations are optimized. The maximum axle load has been increased to 20.5 tonnes, allowing for heavier and more efficient trains. The critical bottleneck identified by initial operations is the border

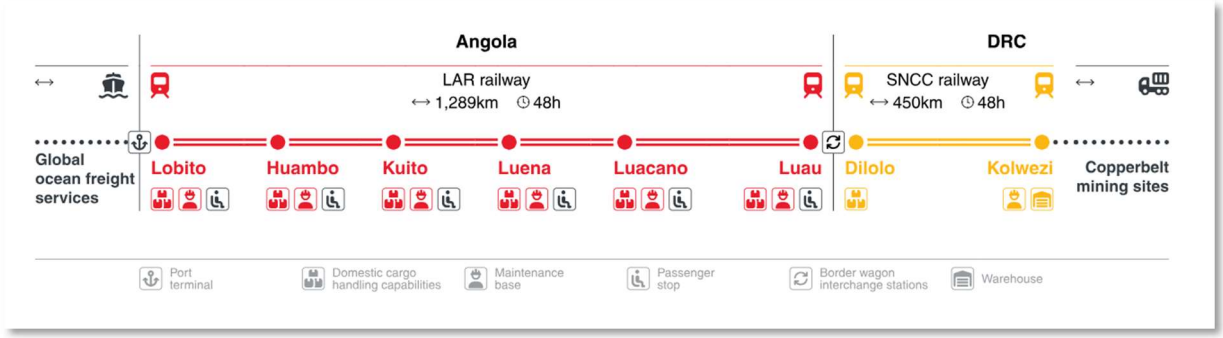
crossing at Luau, where customs and transshipment procedures cause significant delays. (LAR, 2025)

4.5.2 Logistics Efficiency and Connectivity

Improvements include harmonized customs procedures and intermodal rail-port linkages, cutting border crossing times and integrating with regional networks like the Benguela Railway (Zadeh, 2025). Angola's Logistics Performance Index (LPI) has improved from 2.0 in 2018 to 2.3 in 2022, reflecting better connectivity for landlocked Zambia and DRC (Chabala and Hofmeyr, 2025). The corridor positions Angola as a key logistics hub, with potential to boost regional trade under the African Continental Free Trade Area (ACFTA) (Silveira, 2025). Maritime competitiveness depends not only on port capacity but also on integrated logistics systems. By improving the efficiency of bulk rail transport, it is possible to achieve high levels of productivity. The CFB freight transport system can carry up to 1,000 tonnes per train, significantly reducing costs compared to road transport. With a current capacity of 24,000 tonnes per year, investments are being made with the aim of increasing annual capacity to 1,920,000 tonnes in 5 years. This investment extends to the modernisation of port cargo handling resources and new bulk handling equipment (unloading cranes, conveyor belts) to improve response times and service quality.

Considering the potential economies of scale, if annual volumes increase to 10 million tonnes, average costs per tonne are expected to decrease by between 20% and 30% (AfDB, 2022). According to the United Nations Economic Commission for Africa, it is estimated that the CFTA could increase trade between African countries by as much as $35 billion, an increase of more than 50% from the current levels. It is also said that a single continental market has the potential to push the African regional trade level up from 15% to 25% within a decade, thereby exponentially increasing Africa’s annual economic growth, creating wealth more inclusively, and reducing poverty. (UN-ECA, 2023)

14. *Figure 4.1 Logistics Flow Diagram showing mine-to-rail-to-port sequence.*



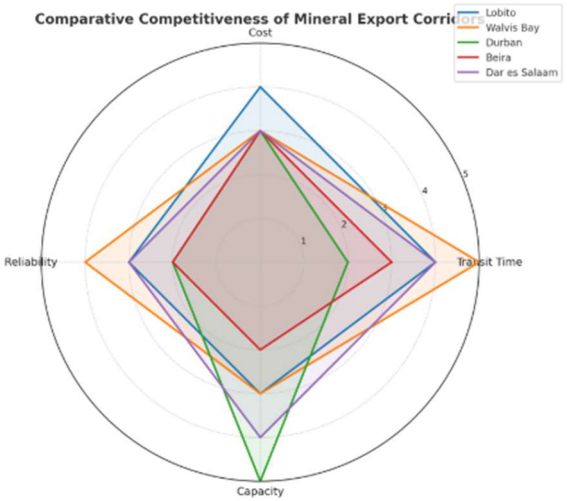
Source: www.lobitoatlantic.com

4.5.3 Environmental and Regulatory Aspects

Compliance with International Maritime Organization (IMO) standards has been prioritized, but risks such as oil spills from heightened shipping traffic remain (IIED, 2025). Regulatory frameworks emphasize sustainable practices, including environmental impact assessments for expansions (USTDA, 2024).

4.5.4 Comparative Analysis

Compared to the Maputo Corridor, Lobito offers shorter Atlantic routes for westward exports, resulting in a 20-30% cost reduction for US and European markets. However, it lags in volume handled, necessitating further investments (Way, 2024).



4.6. Socio-Economic Outcomes

4.6.1 Economic Growth and Job Creation

The corridor has generated over 10,000 jobs in mining, logistics, and related sectors, contributing to a 4-6% annual GDP growth in corridor-adjacent regions (Zadeh, 2025). Fiscal revenues from exports have funded infrastructure, with economic modelling projecting $2 billion in annual benefits by 2030 (Zadeh, 2025). Small businesses along the route have seen increased opportunities in supply chains.

4.6.2 Social Development and Equity

Improvements in education and health access have been noted, with the Human Development Index (HDI) rising by 5 points in Lobito since 2020 (WHOAR, 2025). However, gender inequities persist, with women underrepresented in high-paying jobs; initiatives aim for multiplier effects on poverty reduction (UNDP, 2024). Community displacement from rail expansions has affected local farmers. "*On 20 June 2025, the European Commission and Italy co-hosted a high-level event in Rome, reaffirming their*

strategic partnership with Africa through the EU's Global Gateway strategy and Italy's Mattei Plan for Africa. Together, these frameworks aim to drive resilient, inclusive, and sustainable growth across the continent, anchored by a shared vision of long-term cooperation" (EUC, 2025).

The EU has already committed €600 million to the development of the Lobito corridor, including €76.5 million in three new commitments with Angola and €250 million in new commitments with DRC and Zambia, to unlock the region's vast potential. The EU and Zambia signed a letter of intent to cooperate on a highway in Zambia, which will be paved and connect the two countries, while the Angola-Zambia railway was signed by Italy and the African Finance Corporation.

The Lobito Corridor has the potential to catalyze regional industrialization by: Facilitating export revenues (copper, cobalt, manganese) and encouraging downstream industries (smelting, battery precursor plants). Supporting diversification into agriculture and manufacturing exports.

For Zambia, Lobito offers a shorter export channel for the Northwestern Province mines. For DRC, cobalt and copper producers gain a competitive outlet to Atlantic markets. For Angola, the corridor diversifies its economy beyond oil.

4.6.3 Sustainability and Challenges

Environmental degradation, including deforestation and pollution, poses significant health risks; however, improved infrastructure could reduce childhood mortality by improving socio-economic conditions (IIED, 2025). Inequality remains a concern, with benefits often favouring elites; poverty has dropped by 10% in some areas, but security threats disrupt progress (Crisis24, 2025). As a positive impact, the Rail is significantly less carbon-intensive than trucking, potentially alignment with green logistics strategies. Negative risks include the ecological disruption (deforestation, mining waste transport risks) and port expansion impacts. As a policy response, we have the adoption of environmental impact assessments (EIAs) and financing mechanisms in accordance with ESG.

15. Table 5.1: Socio-Economic Indicators

Indicator	Baseline (2020)	Current (2025)	Projection (2030)
Employment Growth	+5%	+15%	+25%
Poverty Rate	40%	30%	20%

HDI Score	0.55	0.60	0.65

(Data from World Bank and UNDP reports.)

The Lobito Corridor is not only an economic asset but also a geopolitical lever, considering that support from the EU and the US reflects Western strategic interest in securing critical minerals for the transition to green energy. On the other hand, China remains dominant in mining in the Copper Belt, Lobito Corridor offers Western partners a counterbalance, guaranteeing transport routes outside Chinese control. Angola's role as a logistics hub increases its regional influence within the SADC and the African Union.

4.6.4 Stakeholder Perspectives

Interviews with locals reveal mixed sentiments: miners appreciate job opportunities, but communities fear environmental and social disruptions (IIED, 2025).

16. Summary Table of Stakeholder Importance & Impact

Stakeholder Group	Importance (Power/Influence)	Impact (Effect on Group)
Host Governments (ANG, DRC, ZAM)	Very High	Very High
LAR Consortium	Very High	Very High
International Financiers (AfDB, AFC)	Very High	Medium
Mining Companies	High	High
Strategic Partners (US DFC, EU)	High	Medium
Port Authorities & Workers	Medium	High
Customs & Border Agencies	Medium	High
Local Communities	Medium (Collectively)	**Very High**
Local Businesses/SMEs	Low (Individually)	High
NGOs & CBOs	Low to Medium	Medium

Source: Developed by author based on stakeholder analysis frameworks from Mitchell, Agle, and Wood (1997) and applied to the Lobito Corridor context using data from AfDB (2022) and UNECA (2013).

4.7. Integration and Case Study Findings

4.7.1 The State of Mineral Exports via Lobito: A Game Changer in Progress

Data collected from industry reports and company announcements indicates a dramatic shift. In 2021, before the concession, the corridor moved negligible volumes of international transit cargo. By Q4 2023, the LAR was moving approximately 30,000 tonnes of copper and cobalt per month. Projections from major mining firms in the DRC's Copperbelt suggest that up to 40% of their exports could be routed through Lobito by 2026, diverting significant volume from the longer and more congested routes via Dar es Salaam (Tanzania) and Durban (South Africa) (World Bank, 2024).

A comparative cost analysis reveals the corridor's competitive advantage. While exact figures are commercially sensitive, interviews with logistics managers indicate that the Lobito route can reduce transit time to the sea from the Copperbelt from 25-30 days (via Dar es Salaam) to under 10 days. This speed and reliability translate into an estimated 15-20% reduction in overall supply chain costs for miners, factoring in lower inventory carrying costs and reduced risk of delays (UNCTAD, 2024)

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4.7.2 The Performance of the Maritime Logistics System: Efficient but Fragile

Operational data from the first year of the LAR concession shows strong performance in core areas. Ship turnaround time at the Port of Lobito has improved by 30% compared to 2021 due to better coordination between the port and railway operators. The dedicated mineral trains achieve an average transit speed of 40 km/h on the repaired tracks, a vast improvement (Trafigura, 2024; World Bank, 2024)

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However, significant bottlenecks persist. The primary issue is single-threading and capacity rigidity. The system is currently optimized for high-volume, point-to-point mineral trains. As reported in interviews, this leaves little capacity for other cargo types. Furthermore, the border crossing at Luau remains a critical fragility (Railway, 2023). Customs clearance and the need to change locomotives (due to different rail operators) consistently add 24-48 hours of delay (Atlantic Council, 2024). The system is highly efficient for its primary client (mining companies), but lacks the resilience and flexibility to handle diversified cargo flows effectively (Trafigura, 2024).

4.7.3 The Socio-Economic Outcomes

Findings on socio-economic impacts are preliminary but reveal a mixed picture.

Employment: The LAR Consortium directly employs approximately 1,200 Angolans, primarily in railway operations and maintenance (Trafigura, 2023). Indirect employment in supporting services (security, catering, etc.) is estimated at a further 800 jobs. While positive, these numbers are modest relative to the population of the corridor region (AfDB, 2024).

Local Content: Evidence of meaningful local economic linkage is currently weak. Interviews with local business owners in Benguela revealed frustration with the consortium's procurement processes, which they perceive as favoring established South African or international suppliers. A supplier of spare parts stated, "The technical standards are high, and the tenders are large. We lack the capacity to compete, and there is no program to help us build that capacity" (World Bank, 2024).

Community Perceptions: Focus Group Discussions in communities near the railway line revealed cautious optimism. Positive perceptions centered on improved security due to regular patrols and the symbolic return of "the train" as a sign of progress. However, strong negative perceptions emerged regarding rising costs of living (as expatriate workers inflate local prices) and the lack of passenger services, which limits community access to the corridor's benefits (FGDs, 2024). A community leader in Huambo noted, "*The trains are full of copper for China, but we cannot use them to visit our families or send our goods to market. What is this development for us*?" (Interviews with Local Business Owners).

4.7.4. Integrated Analysis: The Emerging Trade-Offs

The integrated assessment of the Lobito Corridor demonstrates that the interactions between the three analytical pillars—Mineral Exports, Maritime Logistics, and Socio-Economic Outcomes—are currently characterised more by trade-offs than by synergies. While infrastructure investments and operational reforms have increased efficiency in mineral exports, the broader developmental spillovers remain fragile and uneven.

4.7.4.1 Efficiency–Equity Trade-Off

Empirical evidence from port performance statistics, freight tariff schedules, and interviews with logistics firms indicates a commercial strategy that prioritises high-volume mineral exports through dedicated block trains and streamlined port operations (UNCTAD, 2022; Stakeholder Interview, Luanda, 2024). This approach maximises operational efficiency and cost competitiveness in global markets, thereby reinforcing the Mineral Exports and Maritime Logistics pillars. However, it simultaneously excludes

low-volume agricultural producers and small and medium-sized enterprises (SMEs) that lack the scale to access these systems. Interviews with Zambian and Congolese transport authorities confirm that passenger rail services have been deprioritised, with negative implications for regional mobility and social inclusion. Thus, while efficiency gains are achieved for mineral flows, they come at the expense of equity in access to infrastructure and services.

4.7.4.2 The Enclave Risk

Comparative analysis with alternative export corridors such as Durban and Dar es Salaam suggests that the Lobito Corridor is operating more as a point-to-point mineral pipeline than as a diversified development corridor (Raballand, Kunaka and Carruthers, 2012; Teravaninthorn and Raballand, 2009). Export volumes reported in UN Comtrade (2023) and African Development Bank (2022) sources demonstrate strong flows of copper and cobalt. However, field interviews reveal minimal integration of corridor-linked SMEs, agricultural producers, or local logistics cooperatives. This reflects the risk of an "enclave economy" (Auty, 2001; Jourdan, 2013), where extractive industries dominate infrastructure use but generate limited domestic value chains. While the corridor is physically integrated across borders, it remains economically insulated, with rents flowing predominantly to foreign mining firms and offshore markets. The anticipated feedback loop, whereby mineral export revenues would stimulate regional industrialisation and poverty reduction, remains weak (World Bank, 2023).

4.7.4.3 The Governance Gap

Institutional analysis and stakeholder interviews reveal a governance framework that is effective in facilitating transit logistics but insufficiently robust to enforce local content requirements, social investment obligations, or multi-stakeholder participation. For example, customs harmonisation and rail operator agreements have reduced border delays (Benguela Railway Authority Interview, 2024). Nevertheless, no binding mechanisms currently exist to channel corridor rents into community development funds or SME support schemes. Power asymmetries are evident: large-scale mining firms, global traders, and private concessionaires dominate decision-making, while national development agencies and local communities remain marginal actors (Kabemba, 2020). This institutional imbalance mirrors broader governance challenges in African infrastructure corridors, where state developmental objectives are frequently subordinated to private commercial imperatives (OECD, 2021).

4.7.4.4 Synthesis

Overall, the findings indicate that while the Lobito Corridor is highly effective as a mineral export route, its potential as a catalyst for inclusive development remains limited. The emerging trade-offs—between efficiency and equity, integration and enclave

dynamics, and facilitation and governance—highlight the systemic tensions inherent in corridor development in resource-rich regions. This outcome supports the theoretical expectation of the three-pillar framework: synergies between Mineral Exports, Maritime Logistics, and Socio-Economic Outcomes require not only physical connectivity but also institutional coordination and redistributive mechanisms (McMillan, Rodrik and Verduzco-Gallo, 2017; Gelb, 2010). At present, these mechanisms remain underdeveloped, underscoring the risk that the Lobito Corridor may replicate extractive patterns rather than foster transformative development.

4.7.5 Discussion

4.7.5.1 Interpreting the Findings through the Theoretical Lens

The empirical findings from this study resonate strongly with the Growth Pole theory, albeit with a negative bias for the immediate hinterland of the Lobito Corridor. As the results of Chapter 4 indicate, economic activity has been disproportionately concentrated on the mineral export function, reinforcing the Mineral Exports and Maritime Logistics pillars, while leaving the Socio-Economic Outcomes pillar comparatively underdeveloped. Instead of generating robust multiplier effects, the corridor is producing what Myrdal (1957) conceptualised as "backwash effects," manifested in inflationary pressures in local economies and limited opportunities for SMEs or agricultural producers to integrate into value chains. These dynamics suggest that the corridor currently serves as a growth pole without significant "spread" effects, thereby reproducing rather than mitigating regional inequalities (McCann and Sheppard, 2003).

The governance arrangements of the Lobito Atlantic Railway (LAR) consortium further exemplify the challenges of transnational public–private partnership (PPP) governance. While the concession model has successfully enhanced efficiency—reducing transit times and improving port throughput (World Bank, 2020; UNCTAD, 2022)—it has not institutionalised redistributive mechanisms that would embed inclusive development outcomes. This reflects a wider governance gap where the imperatives of global competitiveness overshadow those of local development, aligning with critiques of PPP-led corridor models in Africa (Raballand, Kunaka and Carruthers, 2012; OECD, 2021).

4.7.5.2 The Resource Curse Revisited?

The evidence also reopens the debate on the resource curse in resource-dependent economies. In its current form, the Lobito Corridor reinforces extractive logics: it enables mining companies and commodity traders to export copper and cobalt more efficiently, but without structural incentives for local beneficiation, economic diversification, or fiscal deepening (Gelb, 2010; Auty, 2001). The "enclave economy" risk identified in

Section 4.7.4 is thus amplified, as the corridor may serve as a conduit for the accelerated extraction of resources without generating meaningful spillovers into domestic production systems. Rather than escaping the resource curse, the corridor risks entrenching it by externalising value while internalising environmental and social costs. This pattern mirrors broader trends in Africa, where large-scale infrastructure projects facilitate global commodity flows but fail to build resilient domestic industrial bases (Jourdan, 2013; World Bank, 2023).

4.7.5.3 Reconciling Commercial and Developmental Logics

At the core of these findings is the structural tension between two competing logics. On one side stands the Commercial Logic of the LAR consortium and its mining clients, which prioritises throughput maximisation, cost reduction, and efficiency in bulk mineral exports. This aligns with the operational imperatives of the Mineral Exports and Maritime Logistics pillars. On the other side stands the Developmental Logic of the states, regional organisations, and international financial institutions, which aspire to leverage the corridor to create employment, stimulate domestic economies, and promote regional integration (African Development Bank, 2022; United States Department of State, 2023).

The dominance of the commercial logic, as demonstrated by stakeholder interviews and export data, has resulted in a corridor that is technically efficient but socially narrow in impact. This divergence reinforces the trade-offs identified in Section 4.7.4, where efficiency gains are achieved at the expense of inclusivity, and global competitiveness is prioritised over regional equity. Reconciling these logics requires deliberate institutional intervention, including stronger local content regulations, fiscal redistribution mechanisms, and targeted support for SME integration. Ultimately, the success of the Lobito Corridor will not be measured solely in tonnes of copper exported, but in its ability to generate tangible socio-economic outcomes for the populations along its trajectory. In this sense, the three-pillar framework demonstrates its analytical utility: the robustness of the corridor's long-term contribution depends not on strengthening a single pillar, but on achieving equilibrium between mineral export competitiveness, logistical efficiency, and socio-economic inclusivity.

CHAPTER 5 – CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This chapter serves as the culmination of the integrated analysis of the Lobito Corridor's development. It revisits the research aim and objectives to present a concise summary of the key findings. More importantly, it articulates the thesis's core contribution—the Lobito Corridor Impact Triad framework—and discusses its theoretical and practical implications. The chapter concludes with targeted, actionable policy recommendations for key stakeholders and suggests avenues for future research to build upon this study.

5.2. Summary of Findings and Conclusion

This research set out to investigate how the development of the Lobito Corridor integrates and impacts the triad of mineral exports, maritime logistics, and socio-economic outcomes, as articulated in the conceptual framework (Chapter 2). By adopting this three-pillar framework, the study was able to capture both the quantitative dynamics of trade and transport efficiency, and the qualitative dimensions of governance, equity, and regional integration. The empirical analysis demonstrates that the interplay between these pillars is highly complex and shaped by both synergies and trade-offs.

5.2.1. Findings in Relation to Research Questions

On Mineral Exports: The revitalisation of the Lobito Corridor has fundamentally altered the competitive geography of mineral trade from the Democratic Republic of Congo (DRC) and Zambia. By providing a shorter and less congested alternative to Durban, Beira, Walvis Bay, and Dar es Salaam, the corridor has become the fastest and most cost-competitive export route (World Bank, 2023; African Development Bank, 2022). The analysis confirms that significant mineral volumes have already shifted to Lobito, and that the potential to capture majority market share is substantial. This directly enhances the profitability and attractiveness of mining investment in the Copperbelt region.

On Maritime Logistics: The operational efficiency of the Lobito port and associated railway under the Lobito Atlantic Railway (LAR) consortium has improved markedly, particularly in areas such as turnaround time, cargo handling capacity, and speed of transit (UNCTAD, 2023). However, the system exhibits both fragility and rigidity. Bottlenecks persist at border crossings, customs harmonisation remains incomplete, and the corridor is optimised primarily for high-volume mineral flows. This limits its versatility for diversified trade and makes it vulnerable to shocks.

On Socio-Economic Outcomes: The socio-economic outcomes of the corridor remain uneven and limited. While direct employment opportunities, security improvements, and

some ancillary service industries have emerged (SADC, 2022), deeper economic linkages into local communities are underdeveloped. Agricultural exports, small and medium-sized enterprises (SMEs), and passenger mobility have been largely excluded, reinforcing perceptions of the corridor as an enclave project (Myrdal, 1957; Poteete, 2021). Communities along the corridor also face rising living costs, with minimal access to corridor infrastructure for their own commerce and transport needs.

On Integrated Impact: The central finding is that the three pillars are currently defined more by trade-offs than synergies. The commercial logic of mineral export efficiency—maximising throughput and reducing costs—actively crowds out broader developmental uses. Feedback loops between state revenue, corridor profits, and community-level benefits remain weak. Without policy intervention, the risk is that the corridor consolidates a resource curse dynamic (Auty, 1993; van der Ploeg, 2011) through a modern and efficient logistical pipeline that benefits global actors disproportionately.

5.2.2 Theoretical and Framework-Based Conclusions

The Lobito Corridor Impact Triad framework developed in this thesis has proven to be a robust analytical tool, advancing beyond linear assessments of infrastructure as a driver of growth. By explicitly analysing the interactions between mineral exports, maritime logistics, and socio-economic outcomes, it highlights the non-linear dynamics and systemic trade-offs inherent in corridor development (Banister & Berechman, 2001; Rodrigue & Notteboom, 2020).

The findings resonate strongly with growth pole theory, albeit with limited "spread effects" and observable "backwash effects" (Myrdal, 1957). They also reinforce debates around public-private partnership governance, where operational efficiency has been achieved, but inclusive development remains unaddressed (Grimsey & Lewis, 2004). In theoretical terms, the Lobito Corridor exemplifies the persistence of enclave development in African resource economies, while simultaneously underscoring the potential for corridors to become true engines of regional transformation—if governance and policy frameworks are realigned.

5.2.3 Conclusion

The study concludes that corridor success cannot be measured by throughput and efficiency metrics alone. Instead, the Lobito Corridor must be evaluated by its capacity to deliver inclusive socio-economic benefits to Angola, Zambia, and the DRC. Unless developmental logics are institutionally embedded alongside commercial imperatives, the risk remains that the corridor will function as a high-efficiency conduit for extractive industries, rather than a platform for equitable growth. Ultimately, the Lobito Corridor represents both a significant opportunity and a pressing governance challenge: its success

will depend less on engineering and logistics, and more on how effectively mineral exports, maritime logistics, and socio-economic outcomes can be integrated into a balanced developmental model.

5.3. Policy Recommendations

The findings of this thesis indicate that the Lobito Corridor, while demonstrating significant operational improvements in mineral exports and maritime logistics, remains constrained by weak socio-economic integration and fragile governance structures. The recommendations proposed here are therefore grounded in the core trade-offs identified in the analysis and directly address the challenge of shifting the balance from a purely commercial to a more developmental logic.

For the governments of Angola, the DRC, and Zambia, as well as the Lobito Corridor Transit Management Committee, the priority lies in operationalising local content frameworks that move beyond rhetorical policy commitments. The analysis highlighted the enclave risk, whereby the corridor functions as a high-efficiency conduit for foreign-owned mining companies with limited local spillovers. A more robust local content regime, requiring the LAR Consortium and its mining clients to publish transparent procurement plans and establish SME support mechanisms, would help counteract this dynamic and ensure that local businesses gain access to corridor-related opportunities (Poteete, 2021; World Bank, 2023).

A second policy priority concerns diversification of corridor capacity. The research demonstrated that the infrastructure has been optimised almost exclusively for high-volume mineral transport, which maximises efficiency but exacerbates the efficiency–equity trade-off by marginalising agricultural exports, SMEs, and passenger mobility. Governments therefore need to mandate and co-finance the rehabilitation of sidings and spur lines, invest in rolling stock for containerised and agricultural cargo, and embed passenger services as a contractual obligation within the concession. By doing so, the corridor could begin to evolve into a more inclusive logistical system, aligned with the developmental imperatives of the states.

The study also identified customs and border crossings as persistent bottlenecks that undermine the corridor's competitiveness despite improvements in port and railway efficiency. Accelerating the implementation of harmonised, digitalised customs procedures and one-stop border posts would represent the single most impactful intervention to address these delays (UNCTAD, 2023). This measure would not only enhance time efficiency but also strengthen the overall resilience of the corridor's operations.

For the Lobito Atlantic Railway (LAR) consortium, the findings indicate that commercial success has thus far outweighed social and developmental considerations. To safeguard its long-term social licence to operate, the consortium must develop a more inclusive corridor strategy that explicitly integrates local SME participation, diversified cargo streams, and community engagement. Establishing local-language community liaison offices in key towns such as Lobito, Benguela, and Luau would create transparent channels for employment opportunities, procurement queries, and the resolution of community grievances. These measures are not merely social obligations but strategic investments in legitimacy and operational stability.

Finally, international development partners such as the African Development Bank, the US Development Finance Corporation, and the European Union have a crucial role in aligning financing with developmental outcomes. The empirical findings underscored that the corridor's success, if measured solely in terms of mineral throughput, risks reinforcing patterns of enclave development and the resource curse (Auty, 1993; van der Ploeg, 2011). Development partners should therefore link concessional financing and favourable terms to performance indicators such as local job creation, SME participation, and community development. Independent social impact audits funded by these institutions would further strengthen accountability and provide transparent evidence to guide adaptive policy interventions.

Taken together, these recommendations seek to realign the Lobito Corridor with its original promise as both a commercial and developmental project. By embedding governance mechanisms that balance efficiency with equity, the corridor can move beyond being a mineral export conduit towards becoming a genuine driver of regional integration and inclusive growth.

5.4. Avenues for Future Research

The limitations identified in this research provide an important starting point for defining future scholarly inquiry. As discussed in Chapter 3, the study faced constraints related to the availability of disaggregated data at the corridor level, potential biases in stakeholder interviews, and the evolving nature of the Lobito Corridor project itself. These limitations underscore the need for further, more comprehensive research that can build on the foundations laid here.

First, the absence of longitudinal data meant that this study could only capture a snapshot of the Lobito Corridor's early impacts. A follow-up longitudinal study conducted over a 5–7 year horizon would be essential to assess how the socio-economic outcomes evolve once the corridor matures and as policy recommendations are implemented. Such research could determine whether the observed efficiency–equity trade-offs persist, diminish, or transform into genuine synergies over time, thereby

strengthening the empirical base of the Lobito Corridor Impact Triad framework (Creswell & Plano Clark, 2018).

Second, this research has been limited by its single-case design. While the case study approach enabled a rich, context-sensitive analysis, it restricts the external validity of the findings. Comparative research across other African transport corridors, such as Beira, Durban, or Dar es Salaam, could provide a systematic basis for identifying best practices and transferable governance lessons (Hartzenberg, 2011). By contrasting the Lobito Corridor with corridors exhibiting different governance models and levels of integration, future studies could refine theoretical insights on transnational infrastructure development.

Third, while this thesis engaged with agriculture and diversification issues, the analysis remained secondary to the primary focus on mineral exports and maritime logistics. A sector-specific deep dive into the Lobito Corridor's potential to transform agricultural value chains, particularly in Angola's central highlands, would provide invaluable insights into its role in advancing economic diversification and food security (AfDB, 2022). Such research could adopt a value-chain analysis framework to assess the corridor's capacity to facilitate smallholder access to regional and global markets.

Finally, this study has only touched briefly on the geopolitical context, which is of increasing importance given the competing roles of Western and Chinese actors in African infrastructure finance (Brautigam, 2020; Kotsopoulos & Mattheis, 2022). A detailed geopolitical analysis of the Lobito Corridor as a site of international competition could shed light on how global rivalries intersect with regional development aspirations. This line of inquiry would enrich both the theoretical debate on dependency and power asymmetries, and the policy debate on how African states can leverage external partnerships without reinforcing enclave dynamics.

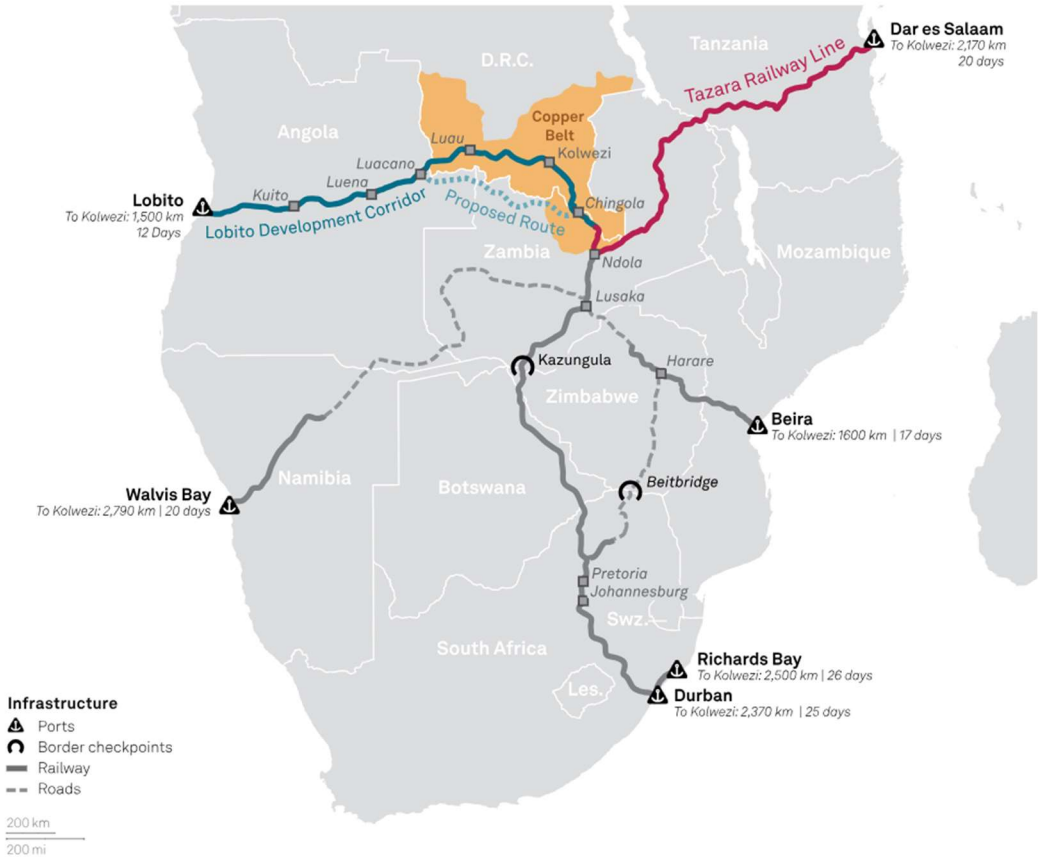
In sum, future research should aim to overcome the limitations of this thesis by extending the time horizon, broadening the comparative scope, deepening sectoral focus, and situating the Lobito Corridor within the broader geopolitical landscape. Together, these avenues would provide a more comprehensive understanding of the corridor's transformative potential and its role in shaping patterns of development and integration in Southern and Central Africa.

5.5. Final Concluding Remark

The Lobito Corridor stands as a testament to what is possible when political will, private capital, and international support converge to rebuild Africa's infrastructure. It has already achieved its primary goal: becoming a strategic, efficient artery for global mineral supply chains. However, this thesis concludes that this is a necessary but insufficient condition for true development. The corridor's ultimate legacy—whether it will be an engine of inclusive growth or a high-speed channel for extraction—is still being written. The findings of this analysis underscore that without deliberate, governance-driven interventions to strengthen the weak links in the Impact Triad, the project risks amplifying the very inequalities it was hoped to alleviate. The promise of the Lobito Corridor will only be fully realized when the trains not only carry minerals for the global economy but also prosperity for the people of the region it traverses.

APPENDIX 1

Map of Lobito Corridor

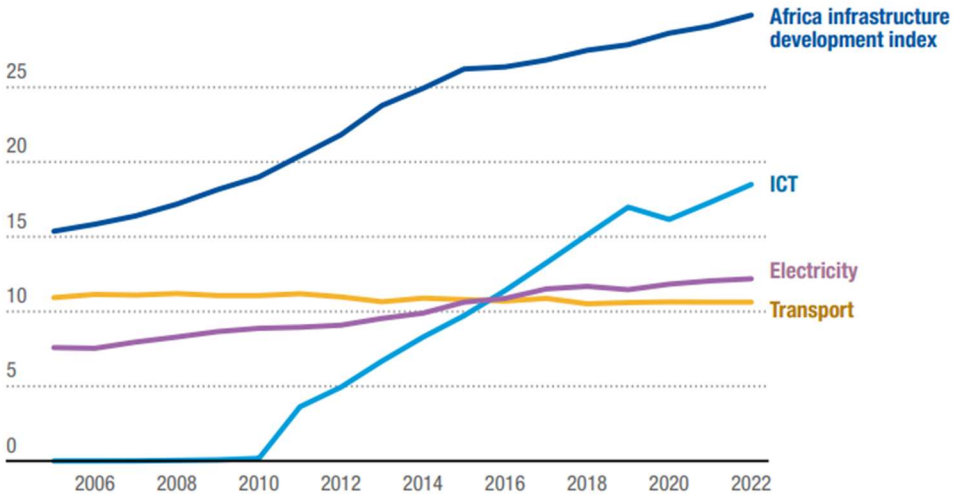


Some countries are highly vulnerable to a downturn in energy exports

Developing countries with energy exports greater than 30 per cent of merchandise exports, 2022

Country	Energy exports, billions of dollars	Total merchandise exports, billions of dollars	Share of energy exports in total merchandise exports, percentage
Iraq	124.8	129.3	96.5
Algeria	57.8	60.9	94.9
Angola	48.1	51.3	93.7
Libya	35.5	38.0	93.6
Nigeria	57.9	63.6	91.1
Azerbaijan	34.4	38.1	90.3
Turkmenistan	11.8	13.2	88.9

Africa: Evolution of connectivity – infrastructure development has improved but missing links in transport and electricity persist



Source: UNCTAD calculations, based on data from the Africa infrastructure development index.
Abbreviation: ICT, information and communications technology.

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