



Analysing the sustainability of intra-SACU trade in the context of existing infrastructure challenges

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Abstract

This dissertation investigates the sustainability of intra-regional trade within the Southern African Customs Union (SACU) amidst persistent infrastructure challenges. Employing a qualitative Systematic Literature Review (SLR) methodology, the study synthesises evidence from 28 peer-reviewed articles, institutional reports, and policy documents published between 2010 and 2025. The research is grounded in classical and contemporary trade theories including comparative advantage, New Trade Theory, and global value chain frameworks to contextualise SACU's trade dynamics.

The findings reveal that intra-SACU trade sustainability is critically undermined by three interconnected challenges: severe infrastructure deficits (deteriorating road networks, port congestion, and unreliable energy supplies); pervasive non-tariff barriers (cumbersome customs procedures, regulatory fragmentation, and inconsistent standards); and structural economic asymmetry institutionalised by the SACU Revenue Sharing Formula, which creates fiscal dependency for Botswana, Lesotho, Namibia, and Eswatini (BLNE countries) while entrenching South Africa's dominance. These challenges form vicious cycles: road freight dependency generates excessive carbon emissions, exposing members to carbon border taxes; infrastructure disparities perpetuate inequality; and administrative inefficiencies inflate logistics costs with border delays raising significant costs for operators.

Comparative analysis using the Logistics Performance Index, Global Competitiveness Index, and Road Quality Index demonstrates that while SACU outperforms the East African Community regionally, all members except South Africa fall below global benchmarks. The study's key contribution is a phased implementation roadmap addressing these challenges through immediate actions (digitisation, NTB removal), medium-term measures (SME support, regulatory harmonisation), and long-term strategies (regional value chain development, Revenue Sharing Formula reform). The research concludes that sustainable intra-SACU trade requires coordinated investment in both hard and soft infrastructure, genuine political commitment to

regional integration, and systemic policy reforms that move the union from fiscal dependency toward productive, equitable, and environmentally sustainable trade.

Keywords:

- The Southern African Customs Union (SACU)
- Regional Economic Community (REC)
- Intra-SACU trade
- Trade sustainability
- Road freight transport
- Landlocked countries
- Trade facilitation
- Cross-border trade in SACU, road infrastructure and sustainability
- BLNE countries (Botswana, Lesotho, Namibia and Eswatini)
- Southern African Development Community (SADC)
- African Continental Free Trade Area (AfCFTA)
- East African Community (EAC)
- Non-Tariff Barriers (NTBs)
- Regional value chains (RVCs)
- Revenue Sharing Formula (RSF)
- Common External Tariff (CET)
- Economic asymmetry/hegemony
- Logistics Performance Index (LPI)
- Road Quality Index (RQI)
- Global Competitiveness Index (GCI)
- Public-Private Partnerships (PPPs)
- Carbon Border Adjustment Mechanism (CBAM)
- Greenhouse gas (GHG) emissions
- Hard infrastructure
- Soft infrastructure
- Digital infrastructure
- Systematic Literature Review (SLR)
- Traditional Literature Review (TLR)

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Chapter 1: Introduction

1.1. Overview of the Southern African Customs Union

1.1.1 The Southern African Customs Union

The Southern African Customs Union (SACU) is the oldest in the world, having been established in 1910. It comprises five Member States: Botswana, Eswatini (formerly Swaziland), Lesotho, Namibia and South Africa. It aims to facilitate trade and economic cooperation among its members by eliminating tariffs and quotas on goods traded within the union, adopting a common external tariff (CET) for imports from non-member countries and redistributing customs revenue to Member States based on a revenue-sharing formula. The CET ensures that goods imported from countries outside the union face the same tariff, regardless of the port of entry within SACU (SACU, 2023).

Economically, SACU serves a crucial role in the African region. Notably, over 50% of intra-African trade occurs within the SACU bloc (SACU, 2023). This internal trade is significant for the landlocked Member States—Botswana, Lesotho, and Eswatini—which rely heavily on their neighbours for access to essential goods and services (see Bosman, 2004:11; PricewaterhouseCoopers Inc., 2018:32). As an international legal body SACU reports directly to the national governments of its member states through the SACU Council of Ministers. This key decision-making body consists of specific ministers from each country: in Botswana, the Ministries of Finance and of Trade & Industry; in Eswatini, the Ministries of Finance and of Commerce, Industry & Trade; in Lesotho, the Ministries of Finance & Development Planning and of Trade, Industry & Business Development; in Namibia, the Ministries of Finance & Public Enterprises and of Industrialisation & Trade; and in South Africa, the National Treasury (Finance) and the Department of Trade, Industry & Competition. These ministers serve as the primary points of accountability and oversight for SACU and its trade agenda within their respective nations.

Table 1: Intra-SACU trade volumes and relative share in total SACU trade (2019-2023)

Year	Intra-SACU imports (R Billion)	Intra-SACU exports (R Billion)	SACU imports from the rest of the world (R trillion)	SACU exports from the rest of the world (R trillion)	Intra-SACU imports as % of Total imports	Intra-SACU exports as % of Total imports
2019	200 422	206 081	1 534 158	1 509 211	13,1	13,7
2020	191 102	188 252	1 396 533	1 599 814	13,7	11,8
2021	207 396	202 699	1 639 829	1 963 777	12,7	10,4
2022	238 216	234 644	1 720 212	2 169 275	13,9	10,9
2023	261 103	281 305	2 297 151	2 296 862	11,4	12,3

Table 1: Intra-SACU trade volumes and relative share in total SACU trade (2019-2023). Source: SACU, 2025

Table 1 shows the trade context of the union. Intra-SACU imports increased from R200 billion in 2019 to R261 billion in 2023, while exports rose from R206 billion to R281 billion over the same period (SACU, 2025). However, when compared to SACU's trade with the rest of the world, intra-regional trade constitutes only a small fraction of total economic activity.

SACU imports from the rest of the world grew from R1.53 trillion in 2019 to R2.29 trillion in 2023. As a result, intra-SACU imports in 2023 accounted for approximately 11.4% of SACU's total imports from the rest of the world (SACU, 2025). Similarly, SACU exports to the rest of the world increased from R1.50 trillion to R2.29 trillion, meaning intra-SACU exports represented just over 12.2% of total exports in 2023 (SACU, 2025).

The data reveals a concerning trend for intra-SACU trade sustainability, while absolute volumes of intra-regional trade grew from 2019 to 2023, their share of SACU's total trade declined significantly. This relative decline indicates that intra-SACU trade is losing economic ground to external global trade, raising critical questions about its long-term sustainability despite its unique range of goods and services.

As aforementioned, intra-SACU trade involves a diverse range of goods and services, reflecting the economic specialisation and comparative advantages of member states. Sectors such as mining and quarrying, manufacturing, and financial and business services are among the key contributors to the SACU economy (SACU, 2024:9).

Traded items include manufactured goods, agricultural products, minerals, machinery, and services.

South Africa plays a central role, acting as both the largest exporter and importer within the union. In 2023, South Africa accounted for 86% of SACU's total imports from the world and 89% of the union's exports to global markets (SACU, 2025:11). This position is supported by the country's relatively large and diversified economy, which includes advanced industrial and manufacturing capabilities (Stuart, 2017:5). The remaining SACU Member States—Botswana, Namibia, Eswatini, and Lesotho—actively participate in intra-regional trade, contributing to broader regional integration and interdependence.

Botswana, a major diamond producer, relies heavily on South Africa for imports. In 2023, South Africa exported goods worth \$4.19 billion to Botswana and imported \$521.5 million. Key South African exports included fuels (\$960.7 million), consumer goods (\$2.40 billion), and Machinery & Electrical equipment (\$549.7 million). Botswana's main exports to South Africa were in the stone & glass (\$124.1 million) and machinery & electrical (\$159.1 million) categories (WITS, 2023).

Eswatini's trade is closely linked to South Africa. In 2023, South African exports to Eswatini totalled \$1.60 billion, dominated by Fuels (\$363.5 million) and Consumer Goods (\$817.5 million). Eswatini's exports to South Africa were \$1.37 billion, primarily comprised of intermediate goods (\$869.7 million), with significant flows in chemicals (\$507.4 million) and food products (\$375.2 million), demonstrating vertical integration in specific value chains (WITS, 2023).

Lesotho a mountainous and landlocked nation, relies heavily on South Africa for trade. While its intra-SACU imports have decreased in recent years—mainly due to broader economic stagnation worsened by the COVID-19 pandemic—the country remains closely connected to SACU's trade network. Imports from South Africa have consistently accounted for between 90% and 99% of Lesotho's SACU-sourced goods over the past decade. The country maintains a critical trade dependency on South Africa. South African exports to Lesotho in 2023 were \$1.37 billion, led by consumer goods (\$721.0 million) and fuels (\$277.4 million). Lesotho's exports to South Africa

amounted to \$321.2 million, overwhelmingly dominated by textiles and clothing (\$235.9 million or 73.5% of its total exports to South Africa) (WITS, 2023).

Namibia the desert country plays a significant role in regional trade. South Africa exported \$3.37 billion worth of goods to Namibia in 2023, with top categories being consumer goods (\$1.71 billion) and capital goods (\$994.0 million). Namibia exported \$1.02 billion to South Africa, mainly intermediate goods (\$652.6 million) and stone & glass products (\$664.7 million or 65.1% of its total exports to SA) (WITS, 2023).

South Africa also sources key products from its SACU partners. In 2023, its intra-SACU imports were led by Eswatini (40-50% share), followed by Namibia (30-40%) and Botswana (5-10%). Key imported commodities included essential oils, sugar products, cosmetics, and processed goods (SACU, 2023).

Providing further regional context in 2023, the SACU region's economy was estimated at R7.7 trillion, with real GDP growing by 5.4%. Intra-SACU trade showed increases, continuing the trend of regional economic integration (SACU, 2025).

Building on the discussion of intra-SACU trade and the economic interdependence among Member States, road freight plays a vital role in facilitating the cross-border movement for some of these goods. The significance of road transport and infrastructure for SACU trade, given the volumes outlined above, will now be examined.

1.1.2 The importance of road freight in SACU

SACU's intra-regional trade depends heavily on efficient road infrastructure. A large part of goods, mainly supplied by South Africa, is transported by road. For example, in 2020, South Africa exported 27.2 billion units of goods valued at R238 billion to neighbouring countries via road freight (C-BRTA, 2022b:54). The Electronic National Administration Traffic Information System (eNaTIS, 2024) estimated that 393,424 trucks operated on South African roads in February 2024, playing a vital role in facilitating trade within SACU for example, the Oshoek border post was identified as the busiest port of entry in the Southern African Customs Union, with more than 600 trucks a day passing through with cargo destined for eSwatini, Maputo, Durban Port, and Gauteng (Ginindza, 2024).

This reliance on road freight extends beyond South Africa; neighbouring SACU Member States, such as Botswana and Namibia, also heavily depend on their road networks to transport goods, including minerals and agricultural products. Botswana utilises the Trans-Kalahari Corridor to connect with Namibia and South Africa (Botswana Press Agency and Publications, 2022). Meanwhile, Namibia's road freight industry plays a crucial role in its logistics sector, supporting the region's connectivity by linking ports (see Figure 1) to landlocked nations such as Zambia, Botswana, Eswatini and Lesotho. (Namibian Sun, 2019).

Figure 1: Ports of entry to SACU

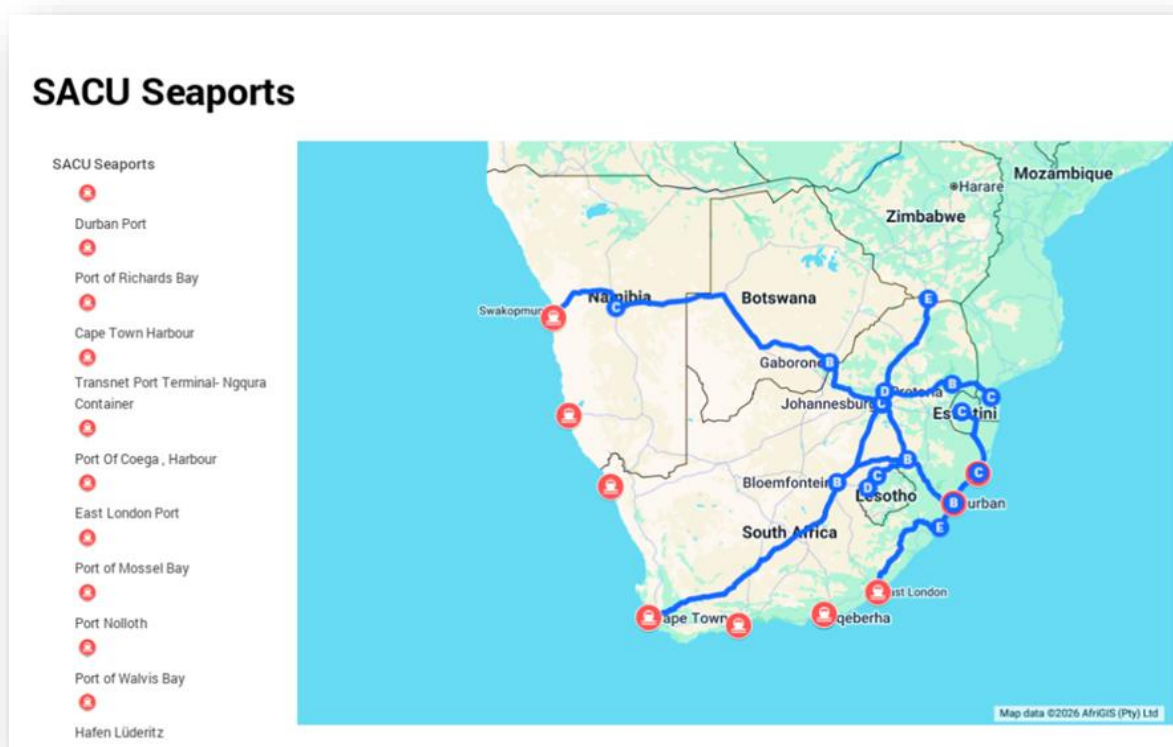


Figure 1: SACU Seaports. Source: Author's own

Road freight is the transportation of goods by trucks on roads (Seatram, 2019), it offers notable advantages, including flexibility, accessibility and door-to-door delivery, particularly in countries with vast and diverse regions, such as those in SACU. In the case of both domestic and international trade the road freight sector facilitates the efficient movement of goods across borders and to neighbouring regions (FDK Transport, 2019).

Domestic road freight involves the movement of cargo within a single country such as South Africa. It encompasses a variety of transport activities, from city-to-city deliveries to local supply chain operations. These activities comply with national regulations outlined in the National Road Traffic Act 93 of 1996, as well as safety standards and vehicle licensing rules (Department of Transport, 2014). The industry features various participants, including logistics operators, trucking companies, and freight forwarders. In contrast, international road freight transports goods across national borders, involving trade and transportation between South Africa and its neighbouring countries, such as Botswana, Lesotho, Namibia, and Eswatini (C-BRTA, 2021; C-BRTA, 2022a). Unlike domestic freight, which is governed solely by national regulations, international road freight services are regulated by both national laws and global trade agreements, as well as customs and transport regulations in destination countries (Vilakazi & Paelo, 2017:5,9, 29-30).

The road freight sector's contribution to the South African economy is substantial. In South Africa, the freight and logistics sectors were valued at \$13.79 billion in 2024, with projections suggesting growth to \$19.9 billion by 2030, driven by rising e-commerce demand, demand for rapid delivery and an extensive road network (Mordor Intelligence, 2024). The sector's expansion is also supported by the underperformance of the rail industry, prompting more businesses to rely on road transport (Research and Markets, 2023; Department of Transport, 2023c:21-36). This growth is expected to persist, with forecasts anticipating a 200% to 250% increase in demand for freight transport over the next 15 to 20 years, especially on high-volume routes such as the Gauteng-Cape Town corridor (FDK Transport, 2019). To facilitate this expansion, South Africa's National Infrastructure Plan 2050 aims to improve road networks, thereby bolstering economic growth and enhancing logistics efficiency (Department of Public Works and Infrastructure, 2022:6).

Figure 2: All Africa Road Transport Corridors

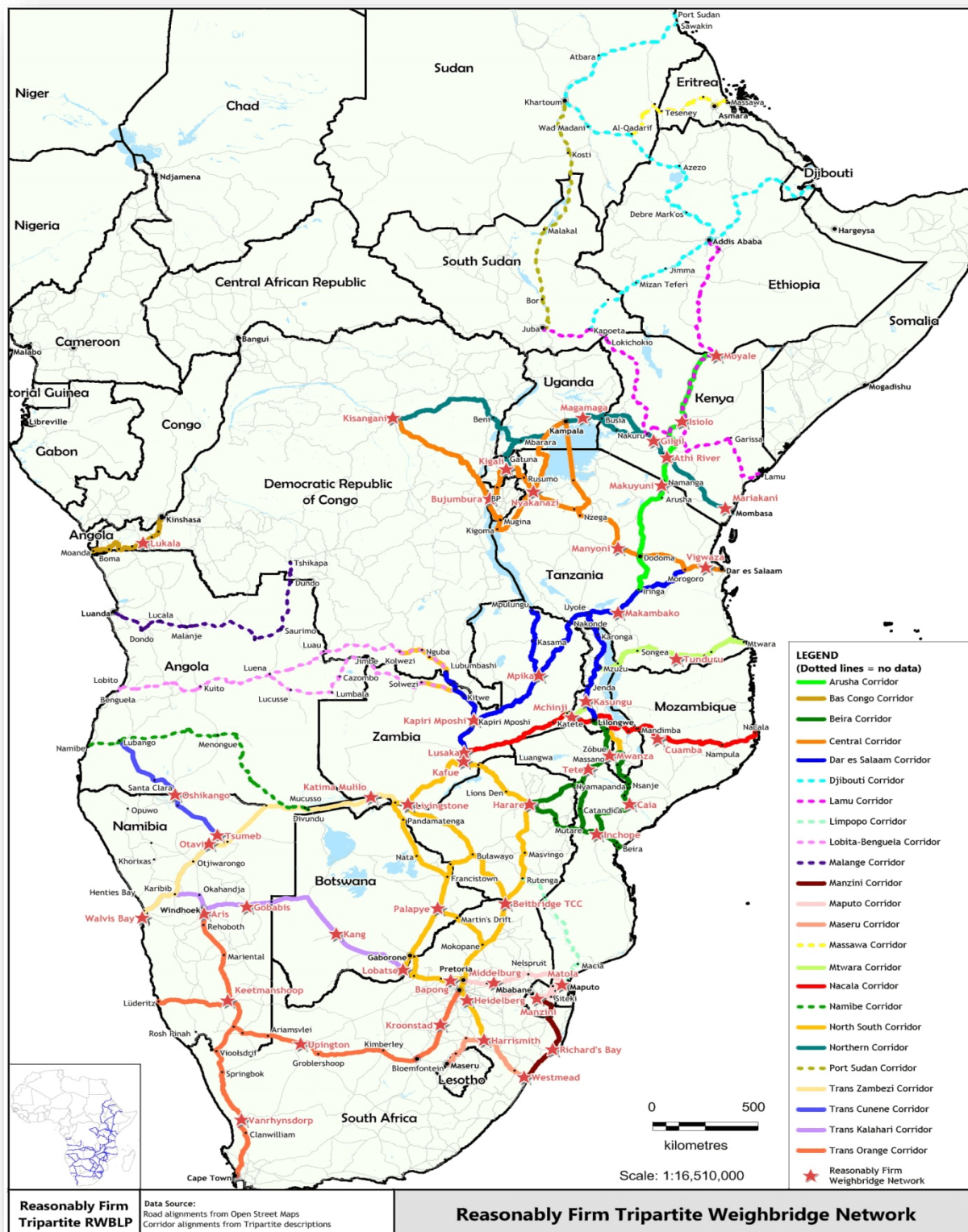


Figure 2: All Corridors. Source: Tripartite Transport & Transit Facilitation Programme

Apart from the size and projected growth of the road freight sector, its economic and developmental importance should also be emphasised. Road freight is essential for economic activity, supporting industries such as retail, manufacturing, agriculture, and construction by enabling the efficient transport of goods (Trancasa, 2023). It also plays a significant role in the employment sector. In 2023, road freight was the largest employer within the transport sector, contributing over 39% to total transport employment (Stats SA, 2023:21). The significance of road freight has grown due to the deterioration of South Africa's rail infrastructure. Freight volumes on rail declined markedly between 2017/18 and 2022/23, owing to insufficient investment in rail and operational inefficiencies (Department of Transport, 2023c:21-36). This has prompted businesses to depend more on road freight, which provides flexibility and efficiency (Goedhals-Gerber *et al.*, 2018:5-10).

Despite its vital role, the road freight industry faces significant challenges, including rising fuel costs, truck hijackings and infrastructure deterioration. Alongside these issues, the sector also encounters problems such as xenophobia, as many companies employ foreign nationals familiar with cross-border travel (Mlepo, 2022; C-BRTA, 2022a:36-37). Despite the social challenges the significance of road freight to cross-border trade in SACU cannot be overstated. It promotes economic and regional integration, enhances trade connectivity and supports international trade networks (C-BRTA, 2021:13, 2022a:1). Additionally, it plays a crucial role in fostering economic cooperation and regional prosperity (Department of Transport, 2023a:25). Statistics South Africa. (2024) gives a detailed view of the commodities moving through South Africa's land freight sector, which is essential for both domestic stability and intra-SACU trade. The performance of these goods in the second quarter of 2024 reveals important shifts:

- **Agricultural and Forestry Products:** Remain vital for local consumption and export, though income from this sector declined by -11.1% year-on-year (Apr-Jun 2024 vs. Apr-Jun 2023), contributing a significant -0.7 percentage points to the overall decrease in freight income.
- **Mining Products:** As a cornerstone of the regional economy, primary mining and quarrying products accounted for 35.6% of freight income. However, this

segment also saw a decline of -3.1%, making it the second-largest negative contributor to total freight income (-1.1 percentage points).

- **Manufactured Goods:** This broad category shows mixed results. While sectors like chemicals and basic metals saw declines, Containers emerged as a major growth area, with income surging by 26.1% and contributing +1.2 percentage points positively to total freight income change. Conversely, Manufactured food, beverages & tobacco experienced a sharp -14.2% drop, representing the largest negative drag (-1.9 percentage points).
- **Motor Vehicles & Parts:** Including assembled vehicles and components. This sector showed moderate growth, with income increasing by 4.7% year-on-year.
- **Retail & Commercial Goods:** Reflecting ongoing economic activity, Commercial Products income grew robustly by 33.7%, while the broader "Other Freight" category (which includes diverse retail and manufactured items) grew by 2.7%.
- **Fuel & Related Industrial Products:** The transport of petroleum products (grouped within Chemicals, coke, petroleum, rubber, plastic and other mineral products) saw stable, moderate demand with a year-on-year income increase of 1.1% in Q2 2024, contributing a minor +0.1 percentage points to the total freight income change.

The movement of these essential goods is facing headwinds. In June 2024, the total volume of goods transported (payload) decreased by 3.7% compared to June 2023, with a corresponding 0.9% drop in income (Stats SA, 2024:2). More strikingly, seasonally adjusted data for the second quarter of 2024 reveals a 5.0% quarter-on-quarter contraction in total payload. This decline was driven almost entirely by road freight, which contracted by 5.8% (contributing -4.9 percentage points to the total decline), while rail freight saw a more modest -1.3% decrease (Stats SA, 2024:3).

The pronounced downturn in road freight payload highlights a critical vulnerability. South Africa's rapidly deteriorating road infrastructure, coupled with underdeveloped networks and poor road conditions in other SACU member states, poses a significant and immediate constraint (Department of Transport, 2018:15; Vilakazi, 2018: 400 - 401). The 2024 data suggest that these infrastructure challenges could possibly be actively impeding the efficient movement of vital commodities. The decline in

transporting key export-oriented and consumption goods like agricultural produce (-11.1%) and mined products (-3.1%) directly threatens supply chain fluidity, economic productivity, and the potential for deeper regional integration. Therefore, addressing the road infrastructure deficit is not merely a logistical issue but a prerequisite for safeguarding and enhancing intra-SACU trade flows. This will further be discussed.

1.1.3 Overview of the state of road infrastructure in SACU

South Africa's road network is a vital component of its infrastructure, supporting economic activity and facilitating connections among different regions. As previously noted, South Africa accounts for 86% of SACU's total imports from the world and 89% of the union's exports (SACU, 2025). This section first provides an overview of the condition of road infrastructure in South Africa and then focus on SACU.

Spanning approximately 750,000 kilometres, South Africa's road network is one of the most extensive in Africa, valued at over R2.1 trillion (National Treasury, 2021:129; Department of Transport, 2023a:26). The network comprises national, provincial, and municipal roads, each serving distinct roles. National roads are essential for long-distance and cross-border travel, while provincial roads connect regions within provinces and municipal roads support local traffic. Major highways such as the N1, N2, and N3 link key cities and economic centres. Notably, the N1, connecting Johannesburg to Cape Town, and the N3, linking Johannesburg to Durban, are vital for economic activity. Some roads are well-maintained, with toll stations in place to fund expansion and maintenance, whereas others face significant infrastructure challenges due to budget limitations and other factors.

South Africa's road network includes both paved and gravel routes. Only 25.5% of the network is paved and utilised more frequently for economic activities such as freight and passenger transport (Department of Transport, 2023a:26). The condition of South Africa's road infrastructure has been deteriorating rapidly. According to the National Treasury (2021:132), 31% of the provincial road network is in poor to very poor condition, which exceeds the international benchmark of 10%. Additionally, about 80% of the roads have gone beyond their 20-year design lifespan (National Treasury, 2021:132; Department of Transport, 2023a:26). The 2017 South African Institution of

Civil Engineering (SAICE) Report Card graded the condition of national roads as were rated as “fit for the future” (B), whereas provincial roads were classified as “at risk of failure” (D) and gravel roads as “unfit for purpose” (E). Budget constraints, underfunding as confirmed in the South African Road Network Condition and Budget Needs Report in 2014, and inefficient resource allocation have exacerbated these issues, making maintenance more urgent than expansion (Department of Transport, 2018:66-69; Ross & Townshend, 2018:3).

Further to the above, road conditions differ across provinces. In Gauteng and the Western Cape, nearly 90% of roads are in "fair, good or very good condition". Conversely, provinces like the Free State and North-West experience ongoing deterioration, with over 50% of their roads in poor condition. According to the Department of Transport South Africa (2023a:26), the country's road infrastructure has been under-maintained for decades due to a lack of strategic focus and inadequate funding. Budget constraints and inefficient resource allocation have worsened these issues, making maintenance far more critical than expansion.

The road maintenance backlog in South Africa remains substantial and continues to grow, with an estimated R128.6 billion needed for paved roads and R281.2 billion for gravel roads (Ross & Townshend, 2018). In 2014, the provincial surfaced road maintenance backlog was estimated at R197 billion (Ross & Townshend, 2018:1). By 2018, this had risen to R185.9 billion (National Treasury, 2021:132), and by 2022, it had further increased to R200 billion, with projections suggesting it could be even higher (Tetley et al., 2022:147). The Department of Transport and the South African National Roads Agency (SANRAL) have emphasised that delayed maintenance significantly raises reconstruction costs. In cases where road maintenance is deferred for five years, the cost of reconstruction can be up to 18 times higher than the cost of routine maintenance (National Treasury, 2021:132-133). To address these issues, South Africa's infrastructure deficit is estimated to require between R4.8 trillion and R6.2 trillion from 2022 to 2030 (DBSA, 2024).

The condition of road infrastructure differs throughout the SACU region.

Botswana has a well-developed road network, particularly its main highways, such as the Trans-Kalahari Highway (See Figure 2), which facilitates regional trade and connectivity. The country has made significant investments in its road infrastructure to support its mining and tourism sectors (Munuhwa *et al.*, 2021). Botswana's transport and logistics development plans aim to transform the country into a regional transport corridor by leveraging its geographical position and encouraging private sector involvement (The Vision 2036 Presidential Task Team, 2016:17). However, rural and remote areas still face challenges with road quality and access, particularly during seasonal weather conditions. Moreover, the Trans-Kalahari Highway in Botswana has experienced notable deterioration, emphasising the urgent need for maintenance (Botswana Press Agency and Publications, 2022).

Lesotho has a relatively under-developed road network compared to other SACU members. The country's mountainous terrain presents significant challenges for road construction and maintenance. Main roads linking major towns and border posts, such as the Maseru-Sani Pass route (See Figure 2), are generally in fair to good condition. Still, many rural roads remain unpaved and difficult to navigate, especially during the rainy season (Poindexter, 2018). Lesotho's mountainous landscape makes road construction costly and complex, limiting access to many areas and thereby affecting economic activities and service delivery. Lesotho's inability to upgrade its transport road network is primarily constrained by systemic failures in public investment management and policy coordination, rather than a lack of funds. A key issue is the inefficient Public Financial Management (PFM), where the Ministry of Public Works and Transport cannot spend the large surplus in the Road Fund for road rehabilitation and maintenance, despite a significant backlog of poor road conditions (Millennium Challenge Corporation USA, 2023: 6, 18). Seasonal weather patterns, including heavy rains and snow at higher elevations, worsen road conditions, causing frequent closures, accidents and increased maintenance needs (Poindexter, 2018).

Namibia has a well-developed road network, especially its main highways, which are crucial for the country's mining and tourism sectors. The Trans-Kalahari Highway is a critical route that enhances trade within SACU. Namibia's dedication to road

infrastructure is apparent in the quality of its national roads, which are among the best-maintained in the region (The Namibian, 2021). The government continues to invest in its road infrastructure. However, despite the well-maintained main roads, rural areas still face issues with road quality and accessibility, having an impact on economic integration and service access. Maintaining the extensive network, particularly in remote and rural areas, remains a logistical and financial challenge.

Eswatini has a smaller but generally well-maintained road network. Key highways and roads connecting major towns and border posts are in good condition. The country's road network spans approximately 4,594 km, comprising 1,500 km of paved roads and 3,000 km of unpaved, government-maintained gravel roads (WFP Logistics Cluster, 2022). Eswatini has prioritised improvements to its road infrastructure to facilitate trade and support economic development in line with the Swaziland Transport Master Plan. Like other SACU members, rural road infrastructure in Eswatini requires further development to improve accessibility and economic integration. Financial constraints limit the scope of potential improvements and budgetary limitations hinder maintenance efforts, particularly in less economically active regions.

Road infrastructure is essential for the economic integration and competitiveness of SACU countries. However, significant challenges persist, particularly in terms of maintenance and investment. The poor quality and deteriorating condition of road networks is not just a Southern African issue but an Africa-wide concern. In 2014, only 29.7% of African roads were paved (Kingombe, 2014:4), but this has since increased to 43%, with South Africa responsible for 30% of all paved roads in Africa (Muleta, 2024; Moore, 2024; Madyibi, 2022:26). The effectiveness and dependability of a country or region's road infrastructure are crucial for its integration into regional and global supply chains.

1.1.4 Cross-border trade challenges in SACU

As noted in the previous section, the primary challenge to cross-border trade in SACU is the poor road infrastructure along key trade routes connecting South Africa to its neighbouring countries. This not only causes delays but also leads to inefficiencies in road freight transport (Vilakazi, 2018: 390–401; C-BRTA, 2022a: 27–28). Vilakazi (2018:390) highlights that poor road infrastructure, combined with high trade barriers

and transport costs, limits economic development in Africa and hinders the growth of integrated regional markets. Likewise, Tandrayen-Ragoobur *et al.* (2022) state that improvements in road infrastructure can reduce transport costs and travel times, which is especially important for the handling of perishable goods and for maintaining supply chain integrity.

Better road networks can handle higher trade volumes, support the movement of goods among Member States, and connect remote areas to major markets, thus allowing businesses in less developed regions to access larger SACU markets. Efficient road systems play a role in reducing congestion at border posts, simplify customs procedures and minimise delays (Department of Public Works and Infrastructure, 2022:25). The cost of inefficiencies is significant: in 2015, transporters estimated border delays at \$400 per day or \$13 per ton per truck load (Vilakazi, 2018:400–401), while in 2021 the C-BRTA (2021) reported that delays at the Skilpadshek border post caused additional annual logistics costs of R18,257,887 for southbound traffic and R78,022,510 for northbound traffic.

Beyond infrastructure, cross-border trade faces several other challenges. Delays at border crossings, complex customs procedures and administrative bottlenecks persist as ongoing problems. Insufficient border facilities—such as customs clearance points, weighbridges and inspection stations—delay processing and hinder the flow of goods (C-BRTA, 2022a:30). These delays disrupt supply chains and increase costs for both consignees and consignors, who incur higher transportation, storage and inventory expenses. Unpredictable waiting times increase these costs, reduce truck turnaround times and raise opportunity costs for drivers (C-BRTA, 2022a:130-131). The increasing number of trucks crossing borders also causes congestion, road damage and higher maintenance costs (Vilakazi, 2018: 390–394; C-BRTA, 2022a: 27–28). Addressing these issues through improved border management systems could significantly reduce costs and foster new economic opportunities (C-BRTA, 2022a:15).

South Africa's major container ports, including Durban and Cape Town (see Figure 1), serve as significant bottlenecks in the country's logistics system. Severe congestion, exacerbated by inadequate road links to inland destinations, further delays the movement of goods (Vilakazi, 2018: 390–394; C-BRTA, 2022a: 27–28).

Simultaneously, crime—encompassing theft, hijackings and smuggling—poses serious risks to road freight operators and disrupts regional supply chains.

Administrative and regulatory inefficiencies further hinder trade flows. A lack of customs coordination across SACU delays border crossings and adds at least \$13 per tonne to transport costs (Vilakazi, 2018:390–401). Landlocked Member States such as Botswana, Lesotho and Eswatini are particularly vulnerable, as they rely heavily on South Africa's transport infrastructure (Mlepo, 2022:24–25). This dependence amplifies inefficiencies and increases the cost of trade within SACU.

Additional logistical hurdles include unwarranted roadblocks along transit corridors, which cause delays and foster corruption as traders are often compelled to pay bribes (Kingombe, 2014:4). Border post inefficiencies, such as lengthy inspections, weighbridge delays and inconsistent customs procedures further increase costs and complexity (Vilakazi, 2018). Collectively, these barriers diminish SACU's competitiveness and hamper regional economic growth.

Security concerns have also become increasingly urgent. In South Africa, violent attacks targeting foreign truck drivers and cargo have escalated, primarily affecting landlocked SACU Member States that rely on South African ports for global access (Mlepo, 2022:25–26). Organised truck hijackings have destroyed more than 1,200 vehicles (LDVs and HGVs) and resulted in the deaths of 200 drivers in just over a year (Mlepo, 2022:28–29). These incidents disrupt supply chains and strain diplomatic relations, highlighting the urgent need for improved route security and enhanced cooperation among law enforcement agencies across SACU borders (Mlepo, 2022:35–36). Strengthening security measures is not optional but vital for establishing a stable and predictable trading environment (Byiers et al., 2021:29; DBSA, 2024).

1.1.5 Policies promoting trade facilitation in SACU

Trade facilitation and its essential role in trade are discussed in Chapter 2 (Section 2.4). Several policies have been implemented within SACU to improve intra-SACU trade and enhance transport infrastructure, with a primary focus on reducing trade barriers and harmonising regulations. Under SACU's trade facilitation and logistics pillar, an operational plan has been established to facilitate the implementation of the SACU trade facilitation and logistics programme. The goal of this initiative is to

streamline customs procedures, reduce non-tariff barriers and enhance border management (SACU, 2023:29). This program has been particularly beneficial for landlocked Member States, such as Botswana, by facilitating smoother cross-border trade through the standardisation of customs processes and the introduction of one-stop border posts (OSBPS) (C-BRTA, 2022ab). Currently, there are six priority Border Posts being considered for the OSBP initiatives which are: Beitbridge border connecting South Africa and Zimbabwe; Lebombo connecting with Mozambique; Maseru and Ficksburg that connects with Lesotho; Oshoek connecting with Eswatini; and Kopfontein connects with Botswana (Department of Transport, 2023a:25).

The SADC Protocol on Transport, Communications and Meteorology further supports the development of regional transport infrastructure, including road and rail networks, across all SADC members (SADC, 2022). Since all five SACU members are also part of SADC, this protocol benefits them as well. Its purpose is to harmonise transport policies and regulations, such as vehicle standards and road safety measures, throughout the Southern African region. By improving connectivity and reducing regulatory complexities, the protocol enhances the efficiency of intra-SACU trade, thus increasing its competitiveness within the broader Southern African market.

National policies and specific investment projects complement and operationalise these regional efforts. Botswana's National Transport Policy, for instance, is being advanced through targeted initiatives like the Initiative for Climate Action Transparency (ICAT) for the transport sector. This project aims to develop a domestic Monitoring, Reporting, and Verification (MRV) framework to track climate policies and actions, directly supporting the creation of transparent systems for managing transport sector emissions and efficiency (The United Nations Office for Project Services, 2021: 4-9). This focus on data-driven policy and institutional capacity is essential for implementing sustainable transport strategies that facilitate trade.

Similarly, Namibia's strategic focus as a regional logistics hub is being realised through major infrastructure upgrades like the Transport Infrastructure Improvement Project (TIIP) Phase II. This project involves upgrading 207 km of railway line to SADC standards, which is critical for shifting freight from road to rail, improving the reliability and capacity of the Walvis Bay corridor, and reducing logistics costs and greenhouse

gas emissions (AfDB, 2023: 6-16). Such investments directly address physical bottlenecks that impede intra-regional trade.

Together, these regional frameworks and national projects contribute to the promotion of intra-SACU trade by addressing interconnected infrastructure, regulatory, and sustainability challenges. They help reduce trade barriers, lower transport and logistics costs, and facilitate the more efficient and climate-resilient movement of goods across SACU Member States.

1.1.6 Defining Infrastructure in the SACU Trade Context

To provide a clear framework for this study, infrastructure is understood here as the integrated system of both physical assets and institutional capacities that collectively enable the movement of goods, services, information, and capital across borders. In the context of SACU, infrastructure is not merely a backdrop for trade but a critical enabler and determinant of trade efficiency, regional integration, and long-term sustainability.

This study adopts a dual perspective on infrastructure:

Hard Infrastructure: Refers to tangible, physical assets such as roads, railways, ports, bridges, energy grids, and digital communication networks. These components form the backbone of transport and logistics, directly influencing the cost, speed, and reliability of intra-regional trade.

Soft Infrastructure: Encompasses the policies, regulations, administrative systems, and institutional frameworks that govern cross-border trade. This includes customs procedures, sanitary and phytosanitary standards, trade facilitation mechanisms, digital platforms for data exchange, and harmonised regulatory environments.

The sustainability of intra-SACU trade is intrinsically linked to the quality, accessibility, and resilience of both dimensions. However, as this study will demonstrate, SACU member states face significant and interconnected challenges across both hard and soft infrastructure domains that undermine the region's competitive potential.

By examining infrastructure through this integrated lens, this research seeks to provide a holistic analysis of how existing infrastructure constraints impact the viability of intra-

SACU trade and to identify pathways toward a more resilient, efficient, and equitable regional trading system.

1.2. Problem statement

Intra-SACU trade is vital for regional economic stability, especially for landlocked members like Botswana, Lesotho, and Eswatini, which depend heavily on essential imports from South Africa. In this study, the ‘sustainability of intra-SACU trade’ is conceptualised through a triple-bottom-line framework, referring to the long-term viability of trade flows assessed by:

Economic resilience: the ability to withstand infrastructure-related shocks and maintain cost-competitiveness. Social inclusivity: the capacity to foster equitable benefits across member states, particularly for landlocked economies. Environmental feasibility: alignment with decarbonisation goals and mitigation of negative externalities from road freight.

This concentrated trade structure, heavily reliant on South African corridors and dominated by road freight, creates a critical vulnerability. The movement of goods facilitated by an estimated 393,424 trucks on South African roads—is fundamentally dependent on the condition of regional infrastructure, making the entire system sensitive to its failures.

However, the sustainable growth of this industry is threatened by significant challenges, most notably the rapidly deteriorating and underdeveloped road infrastructure across the SACU region. These infrastructure deficiencies directly impair intra-SACU trade by increasing costs, reducing efficiency, and undermining the long-term viability of trade flows. Using a systematic literature review, this study examines the extent of existing infrastructure challenges within SACU and assesses their impact on the sustainability of intra-SACU trade

1.3. Research questions

This study has a primary research question and secondary research questions as well as a primary research objective and secondary objectives. This will be explained.

1.3.1 Primary research question

How do existing infrastructure challenges affect the sustainability of intra-SACU trade?

1.3.2 Secondary research questions

1. What are the key infrastructure challenges currently faced by SACU member countries?
2. How does infrastructure quality vary among SACU member countries and compare to regional and global benchmarks?
3. How do road infrastructure deficiencies in SACU (given its importance) impact trade flows between member countries?
4. What roles do government policies and regional agreements play in addressing infrastructure challenges within SACU?

1.4. Research objectives

This study has a primary research objective and a set of secondary research objectives. This will be explained in the following section.

1.4.1 Primary research objective

To analyse the impact of existing infrastructure challenges on the sustainability of intra-SACU trade.

1.4.2 Secondary research objectives

In support of the primary research objective, the following objectives will be investigated:

1. To identify and categorise the key infrastructure challenges encountered by each SACU member country.
2. To compare infrastructure quality across SACU member countries and benchmark it against African and global averages.
3. To evaluate the impact of road infrastructure deficiencies (given their importance) on trade flows between SACU member countries.
4. To examine the roles and effectiveness of government policies and regional agreements in addressing infrastructure challenges within SACU.

1.5 Significance of the research

The study holds significant importance for regional economic development. By focusing on the interplay between trade dynamics and infrastructure quality within the Southern African Customs Union, this research provides critical insights into how infrastructure constraints have an impact on trade efficiency and economic integration. Given that SACU countries share standard trade policies and economic interests, understanding these challenges helps one to identify barriers that hinder intra-regional trade. This, in turn, enables targeted interventions to enhance infrastructure, thereby promoting more robust economic growth and fostering greater regional cooperation. The findings can guide policymakers in prioritising infrastructure investments and reforms, leading to more sustainable trade practices and economic benefits across the SACU region.

Furthermore, this research is crucial for evaluating the long-term viability of intra-SACU trade under current infrastructural conditions. As trade volumes and economic activities evolve, the resilience of trade systems and the capacity of existing infrastructure to accommodate growing demands are pivotal. By analysing how infrastructure challenges affect trade sustainability, the research offers valuable insights into optimising trade routes, reducing costs and enhancing overall trade efficiency. This knowledge is essential for crafting strategic policies that not only address immediate infrastructural deficiencies but also to support the long-term sustainability of regional trade networks. Consequently, this research contributes to enhancing the overall economic stability and integration of SACU countries, promoting a more prosperous and interconnected regional economy. The study's findings make a significant contribution to the academic literature on regional economic integration and infrastructure development, particularly within the context of road freight transport.

1.6 Research design and methodology

This research aims to analyse the sustainability of intra-SACU (Southern African Customs Union) trade, considering the existing infrastructure challenges that have an impact on trade flow and economic integration within the region. To achieve this, a systematic literature review (SLR) is employed as the primary research methodology. This approach enables a comprehensive, structured and objective synthesis of the

available research on the topic, providing insights into existing knowledge gaps and a deeper understanding of the factors influencing the sustainability of intra-SACU trade.

1.6.1 Research design

As mentioned, this study uses a qualitative research design to conduct a systematic literature review. A systematic review was chosen as it allows for a methodical examination of scholarly articles, reports and other relevant publications, ensuring that all sources are reviewed with transparency and reproducibility. The review focuses on studies related to intra-SACU trade, infrastructure challenges and their impact on trade sustainability, with a particular emphasis on transport infrastructure, logistics, and policy frameworks.

The reason why a systematic literature review (SLR) was chosen as a research methodology over an empirical analysis is multi-fold. The primary reason is the absence of reliable and quantifiable data on road infrastructure specific to SACU. While trade statistics are readily available, region-specific data that accurately reflect the quality, deterioration, and performance of road networks—and their direct impact on intra-SACU trade flows—remain limited. Although certain logistical performance indicators and road quality indices exist, these datasets are often incomplete, particularly for smaller Member States such as Eswatini and Lesotho. Consequently, constructing an empirical model would risk generating results that are fragmented, inconsistent or misleading.

The second reason is that the effects of poor road infrastructure cannot be isolated from the wide range of other variables that influence trade performance, including customs inefficiencies, border delays, port congestion, regulatory barriers, and security concerns. Attempting to attribute changes in intra-SACU trade flows exclusively to infrastructure challenges would therefore oversimplify the complex realities of regional trade dynamics.

The third reason covers the concerns that relate to the measurement of trade sustainability (which, in the context of this study, has to do with the long-term viability of trade flows and how effectively it will continue to improve). Unlike conventional trade indicators, such as volumes or balance of payments data, sustainability encompasses multiple dimensions—economic resilience, regional integration and the long-term

viability of trade flows—that cannot be easily captured through quantitative measures alone. The absence of consistent and standardised metrics for trade sustainability within the SACU context further limits the feasibility of a robust empirical assessment.

Considering these challenges, an SLR provides a more appropriate methodological approach. It enables a structured, systematic and comprehensive synthesis of existing research, offering insights into how infrastructure constraints—particularly road networks—intersect with broader trade dynamics in the SACU region. By collating and critically analysing the existing body of knowledge, this approach not only highlights established findings but also exposes significant knowledge gaps, thereby offering a deeper and more holistic understanding of the sustainability of intra-SACU trade in the face of infrastructure challenges.

1.6.2 Data collection

To ensure a comprehensive and credible analysis, data collection will be conducted through a systematic and multi-source review of existing literature. The search will target peer-reviewed journal articles, academic books, and reputable institutional reports published between 2010 and 2025, ensuring the inclusion of contemporary perspectives and findings.

Key academic databases such as JSTOR, ScienceDirect, Scopus, and Google Scholar will be utilised, alongside official publications from the Southern African Customs Union (SACU) and relevant regional bodies. This dual approach guarantees both scholarly accuracy and policy relevance.

A focused set of search terms (see Table 2) will guide the process, combining keywords related to SACU member states, transport infrastructure (such as roads, ports, and logistics), and trade sustainability (including trade flows, regional integration, and policy). Strict inclusion and exclusion criteria will then be applied to filter results, prioritising literature that directly examines the intersection of infrastructure and intra-SACU trade dynamics.

This meticulous methodology is designed to build a robust foundation of evidence, offering a clear and reliable pathway into the study’s subsequent analysis and insights.

Table 2: SLR Key search terms

SLR Key search terms	
• Southern African Customs Union	• Roads, railways, ports, bridges
• SACU	• Infrastructure issues
• Intra-SACU trade	• Infrastructure challenge
• Botswana, Eswatini, Lesotho, Namibia and South Africa	• Infrastructure deficit*
• Infrastructure	• Infrastructure constraint
• Transport infrastructure	• Infrastructure gap
• Trade facilitation	• Infrastructure bottleneck
• Infrastructure quality	• Performance and impact
• Infrastructure development	• Logistics performance
• Trade flow impact	• Trade volume
• Trade barrier	• Regional integration
• Sustainability	• Regional cooperation
• Regional trade	• Government policy
• Policy framework	• Global average

Table 2: Key search terms

1.6.3 Screening and selection criteria

To ensure the quality and relevance of the included studies, the following inclusion and exclusion criteria have been applied:

Inclusion criteria:

- Articles published in peer-reviewed journals, books, and reputable institutional reports.
- Studies addressing SACU member countries or regional trade in Southern Africa.
- Research exploring the relationship between infrastructure and trade sustainability.
- Publications published within the last 15 years (2010-2025).
- Studies focusing on the economic impact of infrastructure on trade flow and regional integration.

Exclusion criteria:

- Studies not focused on SACU or Southern African trade.
- Articles that do not address infrastructure issues or their impact on trade.
- Non-English publications.
- Grey literature such as policy briefs or unpublished reports, unless they are highly relevant.

1.6.4 Data analysis

The collected literature will be analysed using a structured thematic approach to ensure a consistent synthesis of findings. This process involves three key steps:

1. **Data Extraction:** Key findings, evidence, and arguments will be systematically extracted from the selected literature/sources and organized into central themes, such as specific infrastructure challenges, policy impacts, and effects on trade sustainability.
2. **Synthesis of Findings:** A narrative synthesis will be conducted to identify overarching patterns, trends, and contradictions across the literature. This will clarify how infrastructure constraints influence trade dynamics and highlight proposed solutions.
3. **Critical Evaluation:** Each study will be assessed for its methodological strength, empirical contribution, and relevance to the research objective. Emphasis will be placed on robust studies that offer actionable insights for policy and future research.

1.6.5 Expected outcomes

This study aims to provide a comprehensive overview of the challenges and opportunities for sustaining intra-SACU trade, with a specific focus on infrastructure. It also highlights gaps in the existing literature, offer recommendations for policy interventions and propose avenues for future research on the topic.

1.7. Ethical considerations

This study conforms to the ethical guidelines and principles of the North-West University (NWU, 2016:15). Since this study relies solely on secondary data, ethical considerations are limited to ensuring that all sources are correctly cited and that the research adheres to academic standards of integrity and honesty. The data extracted from the literature was used in accordance with intellectual property rights, and the research is intended to be transparent, ensuring that all references are accurately acknowledged.

1.8 Chapter classification

The different chapters in the dissertation are presented as follows:

Chapter 1: Introduction

This chapter serves as the introduction and background to the research proposal titled *Analysing the Sustainability of Intra-SACU Trade in the Context of Existing Infrastructure Challenges*, focusing specifically on the obstacles posed by road infrastructure. It provides the background and scope of the study, constituting the foundation on which subsequent chapters are built.

Chapter 2: Literature review

The chapter is organised into several thematic sections, starting with the introduction, which outlines the purpose of the chapter to provide a traditional literature review that sets the stage for a subsequent systematic review. It identifies the key themes to be covered. The chapter then examines trade theories and their relationship to intra-SACU trade, reviewing classical and modern theories as well as new trade theories. It applies these theories to explain the dynamics, imbalances, and challenges within SACU. The chapter then examines the associated benefits of trade and trade openness. It assesses the empirical evidence on how trade openness drives economic growth, productivity, and innovation, while also acknowledging its limitations and uneven impacts within SACU.

The chapter deals with the concept of regional integration, its documented benefits (for example, larger markets and policy coordination), and the specific challenges SACU faces in achieving equitable and deep integration and at the same time, establishing the critical role of both "hard" and "soft" infrastructure in facilitating trade and enabling the benefits of openness and integration to be realised. Consequently, providing a detailed analysis of the state of infrastructure within SACU, using global benchmarks and indices (Global Competitiveness Index, Logistics Performance Index, Road Quality Index) to compare performance between Member States and with other regions like the East African Community (EAC). The chapter's crucial concluding section explicitly identifies the shortcomings in existing research which this study aims to address.

This chapter establishes a theoretical foundation by grounding the research in established economic theories, providing a lens through which to analyse and understand intra-SACU trade patterns and problems. It clearly demonstrates that while trade and integration are theoretically beneficial, their practical success in SACU is severely hampered by infrastructure deficits and structural imbalances, thereby justifying the study's focus on infrastructure. It brings together disparate sources on trade theory, SACU economics and infrastructure studies, creating a coherent narrative that highlights the interconnectedness of these issues.

The chapter identifies and justifies the research gap and concludes by explicitly pinpointing the gaps in current literature, such as:

- A lack of focus on the direct impact of physical infrastructure on trade performance.
- A disconnect between trade policy assumptions and infrastructure realities.
- An oversight of social and environmental sustainability in trade analysis.

It also succeeds in identifying the absence of standardized frameworks to assess infrastructure's role in SACU trade and sets the stage for the *Systematic Review*. By using a traditional review to identify these gaps, the chapter perfectly sets up the need for the next phase of the research: a systematic literature review designed to formally and rigorously address these specific shortcomings. This chapter builds the case for the entire study. It argues that understanding and improving intra-SACU trade is impossible without a dedicated focus on resolving its infrastructure challenges, a focus that current literature lacks. It transitions from "what is known" to "what needs to be known", creating a clear and compelling rationale for the research that follows. This review sets the stage for the systematic literature review that follows in subsequent chapters, aiming to address these identified gaps with a more rigorous and focused methodology.

Chapter 3: Research methodology

The research design and methodology serve as a critical foundational role in the research. Its primary contribution is to establish the credibility, rigour and structure of the entire study by meticulously detailing how the research is to be conducted.

The study employs a Systematic Literature Review (SLR) as the primary research method, chosen for its rigour, transparency and ability to synthesize multidisciplinary evidence from academic, institutional, and policy sources. The chapter justifies the choice of a qualitative SLR, explaining that it is the best method to synthesize complex, multi-disciplinary evidence from various sources to answer the research questions holistically and without bias.

Literature from 2010 to 2025 has been reviewed to capture post-financial crisis developments, regional policy shifts, infrastructure initiatives and emerging challenges like climate change and security threats. Sources include academic databases (JSTOR, ScienceDirect, EbscoHost, Web of Science, Scopus, and Google Scholar), institutional reports and government publications. Boolean search strategies were used to identify relevant literature. The chapter outlines a transparent, multi-stage process (based on the PRISMA flow diagram) for filtering search results from 370 initial records. Strict inclusion and exclusion criteria are applied to ensure relevance and quality, resulting in 28 selected studies for analysis.

A thematic synthesis approach is used to categorise findings into themes such as infrastructure challenges, trade impact, sustainability, and policy implications.

Studies are evaluated based on journal quartiles (Scopus rankings) prioritising high-quality academic journals (Scopus Q1/Q2) for their rigorous peer-review processes and reputability, with a balanced approach that values both high-impact academic sources and authoritative grey literature. Incorporating essential non-journal sources (government reports, institutional papers) based on strict criteria of authoritativeness, transparency, and relevance, ensures that the review captures critical policy and practical insights.

The SLR follows the structured three-stage process (planning, execution, dissemination) proposed by Tranfield *et al.* (2003). It establishes validity and rigour through adhering to the established SLR framework, the chapter demonstrates that the research was intended to be conducted in a structured, transparent and replicable manner. This minimizes bias and ensures that the findings are based on a robust evidence base which is crucial for the academic credibility of the study.

Chapter 3 acts as a detailed manual for the research process. It creates an explicit understanding of exactly how the literature was found, selected and analysed, leaving no ambiguity about the methods used. The chapter explicitly argues for including not just high-impact journal articles but also crucial grey literature from governments and institutions. This ensures that the review's findings are comprehensive and directly relevant to policymakers, providing actionable strategies for SACU, not just theoretical academic discourse.

Chapter 3 is about the "how" which it meticulously plans and then justifies the methods. Its contribution is that it ensures that the resulting research will be trustworthy, comprehensive and valuable for both academic and practical applications.

Chapter 4: Findings and discussion

The objective of Chapter 4 is to present, synthesise and critically discuss the findings derived from a systematic literature review (SLR) on the challenges and opportunities for sustainable trade within SACU. This chapter serves the crucial purpose of transitioning the research from its methodological foundation to an evidence-based analysis, providing the empirical core of the study. It systematically consolidates insights from a wide range of academic articles, government reports and institutional publications to build a comprehensive understanding of the infrastructural, regulatory, and policy-related impediments that constrain intra-regional trade flows and economic integration.

The chapter aimed to contribute significantly to the research by identifying and analysing four interconnected thematic challenges: critical infrastructure deficits, pervasive non-tariff barriers (NTBs), overarching sustainability concerns and inadequate policy frameworks. It moves beyond merely listing these issues to explore their collective and cross-cutting nature, demonstrating how problems in one area, such as port inefficiencies, exacerbate challenges in another, such as high transport costs and environmental emissions. This analytical depth provides a nuanced diagnosis of the structural constraints that undermine SACU's capacity to function as a resilient, competitive, and inclusive customs union, thereby answering key research questions about the primary obstacles to sustainable trade.

Furthermore, Chapter 4 makes a pivotal contribution by translating these diagnostic findings into a practical and forward-looking policy roadmap. It proposes a structured, multi-phase implementation strategy with immediate, medium-term and long-term actions, offering a clear pathway for policymakers to address the identified challenges. This transforms the chapter from a purely analytical exercise into a foundational element for strategic planning, ensuring the research delivers tangible value by bridging the gap between academic insight and actionable policy intervention. Ultimately, the chapter not only clarifies the current unsustainable trajectory of intra-SACU trade but also provides an evidence-based framework for achieving a more efficient, equitable, and resilient regional economic system.

Chapter 5: Discussion and synthesis of findings

The primary objective of Chapter 5 is to serve as the synthesising core of the research, integrating the theoretical foundations established by the Traditional Literature Review (TLR) with the empirical, evidence-based findings of the Systematic Literature Review (SLR). Its purpose is to move beyond a mere summary of results and instead construct a conclusive, nuanced understanding of the complex forces undermining the sustainability of intra-SACU trade. This chapter acts as the critical bridge that connects the 'what' and 'why' established in earlier chapters, contextualising them within the specific challenges of infrastructure deficits, non-tariff barriers, and structural economic asymmetries to answer the central research question.

A key contribution of this chapter is its rigorous comparative analysis which elucidates how the SLR methodology refined, strengthened and added new dimensions to the insights from the TLR. It systematically identifies areas of convergence, such as the recognition of infrastructure as a primary barrier, while also highlighting crucial divergences, such as the SLR's unique identification of a vicious cycle interconnecting physical infrastructure decay, administrative hurdles, and sustainability threats. This synthesis validates the research approach by demonstrating how the SLR provided unfiltered, quantified evidence transforming general observations into specific, actionable problems and introduced critical new insights on governance failures and environmental risks.

Ultimately, Chapter 5 contributes to the research by translating its synthesized diagnosis into a clear trajectory for action. It explicitly details the implications of the findings for policymakers and regional strategists, arguing that isolated interventions are futile against such interconnected challenges. The chapter grounds the subsequent recommendations in this synthesized evidence, providing the necessary justification for the proposed phased implementation roadmap. The chapter acknowledges the study's limitations, ensuring academic rigour and providing a clear direction for future research, thereby solidifying the chapter's role as the foundational evidentiary pillar for the dissertation's final conclusions and practical, actionable recommendations.

Chapter 2: Traditional literature review

2.1 Introduction

While the overall methodology to be used in this study focuses on a systematic literature review, Chapter 2 uses the traditional format of a literature review to lay a conceptual and thematic foundation for the rest of the study. The chapter organises literature into logical categories and theoretical frameworks. The chapter presents a narrative synthesis of key concepts like trade theory and its importance, especially as it relates to SACU, the benefits associated with trade and trade openness, the role of regional integration and its importance to trade and the importance of trade infrastructure for trade facilitation. It also provides an overview of SACU infrastructure – using existing indices. The chapter also aims to use the traditional format to identify gaps that the systematic literature review (in later chapters) formally addresses.

2.2 Trade theories and their linkage to intra-SACU trade

To provide a solid conceptual foundation for understanding intra-SACU trade dynamics, it is essential to begin with a discussion of the main theories underpinning international trade. These theories illuminate the mechanisms, benefits and the evolving nature of trade relationships and also help to contextualise the importance of infrastructure in facilitating regional trade.

Classical trade theories, such as Adam Smith's theory of absolute advantage and David Ricardo's theory of comparative advantage, form the cornerstone of early trade thought. In *The Wealth of Nations* (1776), Smith (as cited by Hayes, 2024) argued that countries should specialise in producing goods where they hold an absolute efficiency advantage, thereby promoting the most productive allocation of global resources. According to Smith, such specialisation and subsequent trade improve overall efficiency and economic welfare.

Building on Smith's work, Ricardo (1817) (Cited by Ruffin, 2002) introduced the concept of comparative advantage, arguing that even if one country is more efficient in producing all goods, trade can still be mutually beneficial if countries specialise based on relative, not absolute, efficiency (McDonald, 2009). In this way, countries benefit by focusing on the goods they can produce at the lowest opportunity cost, while importing others—leading to enhanced global productivity and higher living standards.

Further expanding on this idea, Boulding *et al.* (2016) discuss the distributional effects of trade or distribution theory, which are not directly captured in Ricardo's model. While Ricardo focuses on relative efficiency and overall gains from trade, distribution theory explores how these gains are shared among the factors of production (e.g. labour and capital), providing valuable insights into trade's broader socio-economic implications—especially relevant for trade sustainability in developing regions.

Modern trade theories have extended these classical foundations. The Heckscher-Ohlin model, for example, focuses on factor endowments—that is, the availability of resources like labour, land and capital. According to this model, countries export goods that intensively use their abundant resources and import those that require scarce ones (Kopp, 2024; Feenstra, 2004). This model adds a resource-based explanation to trade patterns, which is particularly useful in analysing regional blocs like SACU, where resource endowments vary among Member States.

The emergence of New Trade Theory, introduced by Paul Krugman (1979), drew attention to the roles of economies of scale, network effects and inadequate competition in shaping trade flows. This framework explains why countries often trade similar goods (intra-industry trade), and why access to larger markets can lead to greater economic efficiencies. These ideas are particularly relevant when examining regional integration, as expanding the market size can influence production structures and trade patterns.

Recent developments in trade literature have focused on global value chains (GVCs) and the rise of digital trade, both of which underscore the growing importance of infrastructure in sustaining and expanding trade. Baldwin (2016) highlights how GVCs have reshaped international production and trade, making connectivity, logistics, and digital infrastructure central to competitiveness. These insights are echoed in reports by De Backer and Flaig (2017), UNCTAD (2019) and the World Bank (2020), which stress that efficient trade facilitation and infrastructure are critical enablers of modern trade flows—especially in developing regions.

Taken together, these theories offer a comprehensive framework for understanding international trade. Smith and Ricardo's ideas lay the groundwork by highlighting the benefits of specialisation and trade based on efficiency. The Heckscher-Ohlin model

and New Trade Theory build on this by incorporating resource availability and scale economies. Finally, distribution theory and recent work on GVCs and digital trade link these foundational models to modern-day concerns such as inequality, regional infrastructure gaps and trade sustainability.

In the context of the SACU, these trade theories not only inform the rationale for intra-regional trade but also draw attention to the structural and infrastructural conditions necessary to realise the full benefits of integration.

The various Member States within SACU display distinct economic specialisations, yet the region's trade patterns highlight both cooperation and competition. In Chapter One this situation is primarily influenced by South Africa's dominance and the complex interplay of global and regional dynamics within the union.

Adam Smith's concept of absolute advantage explains South Africa's role as the economic backbone of the SACU. Its advanced infrastructure, mechanised agriculture, and energy production capabilities enable it to produce industrial goods, processed foods, and electricity more efficiently than its neighbours (Chimuka *et al.*, 2024:56-57). This dominance is reflected in the SACU's revenue-sharing model, where South Africa contributes 98% of the shared revenue pool while only absorbing half of the redistributed funds. Smaller countries like Lesotho and Eswatini rely on these transfers for over 40% of their government revenue, highlighting their dependency on South Africa rather than fostering independent industrial growth themselves (Stats SA, 2020; Ndzama, 2025: 271).

David Ricardo's theory of comparative advantage forms the basis for the SACU's division of resources. South Africa, with its diversified industrial base and economies of scale, leads in manufacturing and processed goods, supplying machinery, vehicles and refined agricultural products to the region (Harmon, 2015; Chimuka *et al.*, 2024; Lee *et al.*, 2024). In contrast, smaller Member States focus on sectors where they have lower opportunity costs. Botswana utilises its diamond reserves and cutting expertise (Schilirò, 2022:1-8); Eswatini excels in sugar production, Lesotho thrives in textiles (supported by the African Growth and Opportunity Act's (AGOA) duty-free access) (Whitfield, 2022:16-18; McCarthy, 2014:6-8); and Namibia is strong in fisheries and meat processing (Namibia Statistics Agency, 2024). These specialisations can

hypothetically facilitate mutually beneficial trade; for example, Lesotho's textile exports are more competitive than South Africa's potential output due to lower labour costs in that country and advantageous trade preferences (IMF, 2022:87; McCarthy, 2014).

Despite these comparative advantages the SACU suffers from low regional integration. Intra-African trade stands at just 18%, which is significantly lower than Europe's 60% or Asia's 45% (Osuji, 2020:42). Most SACU members mainly export raw materials to global markets while importing manufactured goods from South Africa at higher prices (Osuji, 2020; Chimuka *et al.*, 2024). This irony indicates a disconnect from Ricardo's theory, in that, although Member States specialise in production and trade, they fail to engage in optimal trade among themselves.

Paul Krugman's new trade theory further highlights the structural imbalances in the SACU. South Africa's early industrialisation and economies of scale in sectors like automotive and mining create a self-reinforcing cycle of dominance. Smaller states that are lacking in comparable market size or infrastructure find it extremely challenging to compete when new risks are introduced to bilateral trade (Mlipha & Kalaba, 2019). Krugman's focus on monopolistic competition and network effects also highlights why SACU's trade flows are skewed towards global markets rather than intra-regional exchanges. For example, according to the Meat Board of Namibia's quarterly report (third quarter), the country targets Europe for its beef exports, while its neighbours import processed foods from South Africa or beyond (Angula, 2023:1-2).

In summary, the SACU's trade dynamics illustrate a conflict between theoretical ideals and practical realities. While comparative advantage promotes sector-specific specialisations, absolute advantage and new trade theory explains South Africa's hegemony and the region's fragmented trade landscape (Ndzama, 2025:264-280).

2.3 The importance of trade and trade openness

Understanding the benefits associated with trade and trade openness is fundamental to evaluating the potential for sustainable regional integration. International trade has long been recognised as a powerful engine of economic growth, enhancing productivity, attracting investment, and fostering regional integration. As Ohnsorge and Quaglietti (2023:5) note, trade promotes efficient resource allocation, facilitates

technology transfer and builds economic resilience (El Ganainy *et al.*, 2023:1) especially when trade barriers are reduced and market access is broadened.

Trade openness, which can be defined as the degree to which a country permits the free movement of goods, services and capital across borders with minimal restrictions, is commonly assessed through indicators such as tariff levels, liberal trade policies, and the ease of cross-border transactions (Gava *et al.*, 2025; El Ganainy *et al.*, 2023; Ohnsorge & Quaglietti, 2023:9–10; Malefane & Odhiambo, 2017:888–898). Empirical studies within the SACU support the notion that trade openness helps drive economic growth, although this effect varies by country. For example, Gava *et al.* (2025: 5-6) infer that trade openness positively influences economic development; this notion is supported by El Ganainy *et al.* (2023:5-6,13-14). Gava *et al.* (2025:5-6) elaborate on this by examining how trade openness has a positive influence in Eswatini and Botswana, but shows no significant impact in Lesotho, highlighting diversity across Member States. Similarly, Tala *et al.* (2024) demonstrates that trade openness contributes to financial development, positively affecting long-run growth in SACU economies.

The impact and benefits of trade openness to economic growth and development in SACU are not supported by all authors. For instance, Kutu and Ohonba (2024:56-57) and Manwa *et al.* (2019) find limited empirical evidence that trade liberalisation per se has positively influenced economic growth in the SACU over the past three decades. Similarly, Lee *et al.* (2024), who undertook the study: *Effects of a Customs Union on Economic Growth*, and employed various regression models (including pooled OLS, fixed effects, and random effects), show that no statistically significant relationship exists between intra-SACU trade and economic growth (Lee *et al.*, 2024:893-894). Rather than trade liberalisation, the study identifies domestic investment and foreign direct investment (FDI) as the main drivers of economic growth (Lee *et al.*, 2024:893-896).

Beyond its benefits for economic growth and development, trade openness also plays a crucial role in enhancing regional productivity and economic integration. Hsu and Pereira (2022:106) argue that openness enables countries to leverage their comparative advantages, leading to productivity gains. Trade also serves as a conduit for innovation and technological diffusion, particularly vital for developing economies

where domestic access to advanced technologies is constrained (Hsu & Pereira, 2022: 108). Hsu and Pereira (2022: 108) also emphasise how exposure to international competition incentivises firms to innovate and improve product quality, thereby enhancing both efficiency and competitiveness (Huang, 2022: 1-2). Ohnsorge and Quaglietti (2023:7-26) further affirm that trade pressures can drive technological upgrading, thereby narrowing productivity gaps and fostering inclusive growth.

Nevertheless, it is essential to note that the benefits of trade openness are not automatic (Gava *et al.*, 2025; Hsu & Pereira, 2022:106). Structural constraints—such as high trade costs, tariff complexity, weak infrastructure, and inefficient border management systems—can severely limit the effectiveness of liberalisation (Ohnsorge & Quaglietti, 2023; Malefane & Odhiambo, 2017). This is particularly relevant for the SACU, where infrastructure bottlenecks and customs inefficiencies continue to hinder intra-regional trade. To realise the full advantages of openness, SACU must prioritise improvements in trade facilitation, reduction of logistical barriers, and strengthening of transport infrastructure (El Ganainy *et al.*, 2023:20-25) – this will become evident later in this chapter.

Trade openness can also present challenges. For instance, it can amplify distributional inequities unless accompanied by supportive policies. Lee *et al.* (2024:888-889) investigated these structural disparities. Their studies highlight the fact that South Africa dominates intra-SACU trade, primarily exporting manufactured goods, while the smaller economies rely on raw material exports, such as diamonds and gold. This creates significant trade imbalances, with higher intra-trade-to-GDP ratios for the smaller economies in the SACU, such as Lesotho (78% in 2012) and lower ratios for South Africa (3% to 4%). El Ganainy *et al.* (2023: 2, 24) hint at the potentially unequal impacts, highlighting the need for measures that safeguard the vulnerable from trade shocks during trade expansion. A balanced approach—embracing openness while mitigating social costs—is therefore essential for inclusive and sustainable growth.

In this context, trade openness can serve as a strategic development instrument, particularly when paired with robust infrastructure, strong institutions, and inclusive policy frameworks. For regional blocs like SACU, addressing both opportunities and constraints of trade openness and integration is key to achieving long-term economic

transformation and resilience. As such, the importance of regional integration in trade will subsequently be discussed.

2.4 Regional integration and its importance for SACU and trade

Regional integration refers to the process by which neighbouring countries coordinate and cooperate to strengthen their political, economic and social ties (see Lee *et al.*, 2024:889-891). The benefits of regional integration in trade are well documented in the literature. Scholars have highlighted how integration creates larger, more competitive markets, dismantles trade barriers, and promotes economic policy coordination (Ndzama, 2025; Garba & Wancelous, 2023). As Gammadigbe (2021:4–23) and the Intergovernmental Authority on Development (IGAD, 2024) assert, regional integration stimulates economic growth through economies of scale, reduced trade costs and greater production efficiency. This leads to more efficient allocation of resources across regions and increased opportunities for industrial diversification and export-led growth. Regional integration is also essential because (other than its obvious benefits to trade and trade openness, that has just been discussed) it can also play a transformative role in addressing structural issues such as poverty, inequality and unemployment, which often constrain long-term development (Woyo & Tafirenyika, 2025).

Additionally (similarly to trade openness), integration supports technology transfer and innovation, which are crucial to the improvement of productivity in developing regions. Habiyaemye (2018: 409–425) emphasises that stronger trade ties enable the diffusion of technological knowledge and industrial capabilities, particularly when paired with investment in skills development and institutional support. Such processes contribute to regional value chain development and help countries transition from exporting raw materials to producing value-added goods and services.

According to UNECA (2016:45-50), expanding regional markets also provides firms with access to larger customer bases, which encourages business innovation and supports economies of scale. Coherent public policies and regulatory harmonisation further enhance these benefits. Significantly, regional integration contributes to inclusive development by enabling countries to implement policies that protect vulnerable sectors and promote equitable growth. For developing regions, where

disparities in market size, infrastructure and industrial capacity are significant, this kind of strategic cooperation ensures that smaller and less developed economies are not marginalised.

The literature on regional integration in Africa is quite extensive, reflecting decades of debate on the continent's integration efforts and fragmented markets; however, focused academic work on the SACU remains comparatively limited and often overshadowed by broader studies on regionalism and the African Continental Free Trade Area (AfCFTA). Literature on African regional integration highlights both its political-economy drivers and persistent implementation gaps. Hartzenberg (2011: 1-2, 7) argues that overlapping RECs and small, fragmented markets make integration a rational but complex response to Africa's structural constraints. De Melo and Tsikata (2014: 8), on the other hand, stress how politics, geography and uneven gains often trump efficiency, slowing deeper integration that goes beyond the elimination of tariffs only (De Melo & Tsikata, 2014: 4).

In a world where global economic alliances are continually shifting and regionalism is experiencing a revival; the SACU exemplifies both the potential benefits and the complex challenges that accompany these regional integration efforts.

At its core, regional integration in the SACU aims to facilitate the free movement of goods, (and eventually) also services, capital, and labour across borders. The SACU Member States' regional integration ambitions aim to expand the collective market, improve financial efficiency, and to enhance global trade competitiveness (SACU, 2022). This openness fosters increased trade volumes, lower transaction costs, and enhanced economic complementarities (see Lee *et al.*, 2024:889–891). Within the SACU (as mentioned in chapter one), regional integration has been instrumental in promoting trade liberalisation. This was primarily achieved through the common external tariff (CET) and the SACU's common policies. It also ensures that customs and excise revenues are distributed equitably among Member States, contributing to fiscal stability, especially for the smaller economies within the bloc. These goals are further pursued within its broader continental initiatives, particularly the implementation of the AfCFTA, which seeks to consolidate African markets and promote intra-African trade.

The SACU faces various threats to its regional integration objectives, however. Despite the SACU's longstanding history as the world's oldest customs union, many of its Member States continue to grapple with entrenched social and economic disparities, particularly poverty and income inequality (Woyo & Tafirenyika, 2025). These disparities underscore the uneven distribution of the gains that arise from integration. As mentioned earlier in this chapter, while trade liberalisation in the SACU has facilitated some growth, South Africa's economic dominance has created asymmetries in terms of benefit distribution, with smaller economies in the SACU, such as Lesotho and Eswatini, receiving a disproportionately smaller share of the economic gains (Woyo & Tafirenyika, 2025:77).

Compounding this issue are significant infrastructure deficits, particularly in transport and logistics (section 1.1.3, chapter one), which pose serious barriers to the realisation of the SACU's regional integration's full benefits. As Woyo and Tafirenyika (2025:81) note, the underdeveloped road freight sector—which is critical for intra-SACU trade—constrains regional connectivity and undermines its economic potential. In addition, landlocked SACU members face higher costs and longer customs delays when accessing ports and markets, limiting their ability to integrate into regional and global value chains (De Melo & Tsikata, 2018: 8).

In conclusion, regional integration offers a robust framework for advancing trade, productivity and development and this is also true for SACU. It provides opportunities for economic diversification, industrial development and poverty reduction. However, these benefits will only be fully realised if the structural asymmetries in SACU are addressed and if investment in infrastructure and institutional capacity is prioritised. For the SACU to succeed as a model of sustainable regional integration, a renewed focus on inclusivity, infrastructure development and policy harmonisation is essential.

2.5 The importance of trade infrastructure for trade facilitation

While trade openness is widely acknowledged as a critical driver of economic growth, it is not sufficient on its own to deliver sustained regional development. Within the SACU region, the effectiveness of trade or trade openness is heavily dependent on the quality and efficiency of trade infrastructure and facilitation mechanisms. Without

these enabling conditions, the full benefits of liberalised trade cannot be realised. The literature supporting this argument is discussed subsequently. Infrastructure plays a foundational role in shaping trade flows, reducing transaction costs and supporting regional economic integration. It acts as a core enabler of market accessibility and competitiveness (Olapoju, 2023:8-9; Gachunga & Kuso, 2019). As Ohnsorge and Quaglietti (2023:6-7) explain, in many emerging markets—including SACU Member States—poor infrastructure and weak logistics systems significantly increase trade costs, limiting countries' ability to scale exports or participate meaningfully in regional value chains. These inefficiencies are particularly pronounced in the context of the SACU, where most intra-regional trade relies on South Africa's road infrastructure (Malefane & Odhiambo, 2017:892-893).

Efficient trade infrastructure is crucial for fostering economic growth through enhanced regional integration and connectivity. Several studies (Olapoju, 2023; Han & Li, 2022; Gachunga & Kuso, 2019) underscore the critical role infrastructure plays in overcoming transport and logistical barriers. Gachunga and Kuso (2019) argue that insufficient physical infrastructure—such as poor road networks, unreliable power supplies, and limited communication systems—remains a significant constraint on Africa's trade development. They stress that for trade to catalyse industrialisation and transformation; infrastructure must be aligned with economic capabilities. Transport inefficiencies raise trade costs and diminish competitiveness (Vilakazi, 2021), which is especially of concern in the SACU region, where road freight is the dominant mode of trade logistics.

Quantitative evidence further supports these claims. Han and Li (2022:1–3) find that a 10% increase in infrastructure investment is associated with a 3.9% rise in real income, with over 95% of the gains accruing to the country undertaking the investment. Their analysis further reveals that infrastructure improvements facilitate international trade more than domestic trade due to scale efficiencies in shipping and the strategic importance of global logistics hubs. These findings are particularly relevant for the SACU, where rail and road infrastructure underpin regional trade connectivity, but remain unevenly developed, with smaller member states depending on South Africa's systems.

Infrastructure inadequacies also raise trade costs. Trade costs can be defined as the additional expenses associated with moving goods across borders—including tariffs, transport costs, and regulatory hurdles—and remain high in many developing regions (Ohnsorge & Quaglietti, 2023:15–17). Olapoju (2023) highlights the fact that Africa’s infrastructure gaps significantly contribute to high intra-regional trade costs, thereby undermining the potential for regional value chain development and deeper economic integration—especially within the SACU. Although tariffs constitute only a small portion of these costs, logistical inefficiencies and poor infrastructure significantly inflate the total burden. Ohnsorge and Quaglietti (2023) estimate that trade costs in emerging economies are roughly 50% higher than in advanced markets, primarily due to weak transport systems, inefficient port services and procedural delays. Vilakazi (2021) supports this view, pointing to the structural nature of trade-related inefficiencies that persist despite tariff liberalisation. Efficient trade infrastructure not only lowers transport and logistics costs but also enhances the reliability and resilience of supply chains, which is essential for modern, competitive trade (Vilakazi, 2021; Sied, 2024:11–13).

In the SACU context, South Africa’s transport infrastructure serves as the backbone of intra-regional trade. Most goods traded within the SACU travel via road or rail, making the quality and reliability of South Africa’s transport systems critical to the entire region’s trade performance (Department of Transport, 2023a; Malefane & Odhiambo, 2017). Road infrastructure is of vital importance here (as highlighted in Chapter One, given that most intra-SACU trade occurs via road), but the challenge is that it remains fragmented across the region. For instance, Namibia’s Port of Walvis Bay serves as a key access point for landlocked countries like Botswana and Zambia, yet its potential is limited by poor road connectivity and bureaucratic inefficiencies at border crossings (Nangombe, 2024).

However, infrastructure disparities between South Africa and its neighbouring SACU members create an uneven playing field. Without targeted investments in cross-border infrastructure—such as road corridors, customs facilities and rail upgrades—the sustainability of intra-SACU trade remains fragile (Malefane & Odhiambo, 2017:898).

For developing countries, trade infrastructure is essential in overcoming both physical and regulatory barriers to trade (Tandrayen-Ragoobur *et al.*, 2022). When supported

by well-designed facilitation measures, infrastructure becomes a lever for inclusive and sustained regional integration. This outcome is central to the SACU region's long-term trade sustainability and industrial development agenda.

Infrastructure also plays a crucial role in facilitating trade. According to Seck (2017), streamlined trade processes improve regional trade by enabling faster, cheaper and more predictable flows of goods, ultimately encouraging firms to participate in regional markets and invest in cross-border value chains.

Trade facilitation refers to the set of measures that simplify and streamline the procedures for moving goods across borders (see WTO, 2025), and it plays a crucial role in overcoming these barriers. It includes modernising customs procedures, digitising documentation, and simplifying import and export regulations, all aimed at reducing trade costs and delays. Trade facilitation can also refer to measures that reduce bureaucratic red tape and improve the efficiency of cross-border trade processes. These include digitised customs systems, harmonised standards, simplified documentation, and well-managed border posts (Han & Li, 2022:13–16).

In Africa in general, and in SACU in particular, trade facilitation is desperately needed to enable trade. For example, one-stop border posts, where customs clearance and inspections occur in a single location, significantly reduce waiting times and eliminate duplication of procedures (C-BRTA, 2022a:7). Similarly, electronic data interchange (EDI) systems for customs declarations and digitisation of trade-related documents streamline clearance processes, reducing human error and speeding up trade flow (Han & Li, 2022:13–16). Harmonised regulatory standards, such as vehicle weight limits and product certifications, further smooth trade by ensuring consistency and reducing friction at the borders. Infrastructure serves as a trade multiplier, improving the efficiency of border processes, reducing delivery times, and boosting the competitiveness of exports—particularly for landlocked and resource-constrained member states.

The literature consistently shows that without substantial investment in both physical infrastructure and trade facilitation measures, the gains from trade openness remain limited and unsustainable (Ohnsorge & Quaglietti, 2023:10; Malefane & Odhiambo, 2017:898).

To enhance trade competitiveness and foster sustainable regional growth, SACU must prioritise specific key interventions. This includes upgrading transport infrastructure, streamlining customs and border processes and addressing logistical inefficiencies. Investment in trade infrastructure has proven effective in reducing trade costs and expanding market reach (Lebrand, 2022; Han & Li, 2022:13–16). Not only will this make exports more price-competitive, but it also opens up new regional and global markets for producers in SACU member countries.

2.6 The need for an infrastructure strategy for the SACU

As mentioned in the previous sections, regional integration and infrastructure development are fundamental drivers of economic growth, trade facilitation and sustainable development in Southern Africa, and for the SACU to achieve these outcomes, a balanced approach (or strategy) that integrates both "hard" and "soft" infrastructure is necessary.

As outlined in Chapter 1, *hard infrastructure* refers to physical assets such as transportation networks (roads, railways, ports), energy systems and ICT infrastructure, while *soft infrastructure* includes institutional frameworks, trade facilitation mechanisms, customs procedures and digital solutions (Tandrayen-Ragoobur *et al.*, 2022; Gachunga & Kuso, 2019). These two dimensions are mutually reinforcing: hard infrastructure enables the physical movement of goods, while soft infrastructure ensures operational efficiency by reducing administrative and transactional bottlenecks.

In terms of hard infrastructure, Southern Africa's economic growth remains hindered by inadequate transportation infrastructure. As mentioned in Chapter One, poor road conditions, congested ports and underdeveloped rail systems increase trade costs and disrupt regional value chains (RVCs), thereby limiting the full benefits of integration (EXIM, 2018:9–25). Strategic investments in projects such as the Maputo Development Corridor and the Trans-Kalahari Railway have the potential to reduce transport costs and enhance regional connectivity significantly and this should be prioritised.

Nare and Abdul (2024:16–19) emphasise that geographical distance also remains a key barrier to trade (especially in the SACU), with longer transport routes increasing

logistical costs—an assertion supported by Vilakazi (2021). Modernising port infrastructure and expanding cross-border rail networks can help mitigate these costs, unlock regional value chains and foster economic integration. For example, improved transport corridors between Botswana and Namibia have already led to a 15% increase in regional trade volumes (Nare & Abdul, 2024:19).

Beyond hard infrastructure, soft infrastructure reforms are equally critical. Lengthy customs procedures and administrative inefficiencies impose significant delays. According to Olarreaga (2016:10), each additional day spent on customs clearance results in a 1% reduction in export volumes. Innovations such as the SADC Automated System for Customs Data (ASYCUDA) have demonstrated that digitising customs processes can reduce clearance times by up to 30%, thereby improving trade efficiency (Go, 2018:8–91). Similarly, harmonising standards and reducing non-tariff barriers could cut trade costs by approximately 7% (Tandrayen-Ragoobur *et al.*, 2022:5–15). The optimal use of hard infrastructure is facilitated by robust soft infrastructure—as demonstrated by Rwanda's use of blockchain to track cross-border shipments, which has significantly reduced delays and incidences of fraud (Organisation for Economic Co-operation and Development, 2013:51).

Sustainable development in the region will therefore depend on a coordinated infrastructure strategy involving all stakeholders. Hard infrastructure (or physical infrastructure) such as transport and energy networks will form the backbone of this strategy and enable trade facilitation (Portugal-Perez & Wilson, 2012: 5), while soft infrastructure, like digital innovations will ensure their effective utilisation. Tandrayen-Ragoobur *et al.* (2022:5–14) have found that a complementary relationship exists when integrating both these infrastructure dimensions into a strategy; the SACU has the potential to transform its fragmented economies into a cohesive and competitive regional bloc. This strategy, along with its successful implementation, is crucial for the sustainability of infrastructure and trade in the SACU going forward.

The AfCFTA introduces new complexities into intra-SACU trade. Member States increasingly prioritise broader continental access, sometimes at the expense of regional cohesion. Without a recalibrated policy agenda and infrastructure strategy that promotes balanced integration and targeted infrastructure investment, the SACU

risks entrenching economic dependency on South Africa's strained infrastructure and diminishing its influence in Africa's broader integration agenda.

2.7 Sustainability of Intra-SACU Trade in the context of infrastructure challenges

Economic sustainability depends heavily on reliable transport networks and efficient logistics. As mentioned, when it comes to the SACU, this presents a problem. Deficiencies in road, rail, and border infrastructure continue to increase trade costs and weaken competitiveness (Malefane & Odhiambo, 2017:892-893; Olapoju, 2023:8-9). Vilakazi (2021:389-390) has found that poor road conditions and inconsistent regulations (such as axle load limits) can inflate transport costs by up to 30%, threatening the economic foundation of intra-SACU trade. The SACU's current road and infrastructure conditions, therefore, undermine economic sustainability.

In the future, these persistent inefficiencies risk eroding the SACU's competitiveness in regional and global value chains, leaving Member States vulnerable to external shocks and declining trade viability.

Social sustainability remains uneven, as structural imbalances persist between South Africa and its smaller, landlocked partners. Woyo and Tafirenyika (2025:81) demonstrate that Lesotho, Eswatini, Botswana and Namibia face disproportionately high logistical barriers, which limit smaller firms' access to regional markets and reinforce their dependence on South Africa. Vincent and Njong (2021) argue that soft measures—such as one-stop border posts and digital customs systems—can reduce these inequities. Still, their effectiveness depends on parallel investment in hard infrastructure.

If these disparities continue, intra-SACU trade will risk entrenching existing inequalities, marginalising smaller economies and undermining the inclusivity needed for long-term integration.

Environmental sustainability is also at risk. Inefficient routes and chronic congestion lead to increased fuel consumption and carbon emissions (EXIM, 2018:9–25). As Nare and Abdul (2024:16–19) note, modernising regional transport corridors, such as the

Trans-Kalahari Railway, could simultaneously reduce costs and support greener growth by lowering the carbon footprint of intra-SACU trade.

Without decisive investment in greener infrastructure, the SACU's trade flows could become increasingly misaligned with global sustainability standards, exposing the region to reputational and regulatory risks in export markets.

In summary, the literature suggests that intra-SACU trade will remain unsustainable—both economically, socially and environmentally—unless infrastructure deficits are systematically addressed. This underscores the importance of the present systematic review, is to identify which hard and soft infrastructure interventions are most effective in fostering a resilient, inclusive and low-carbon intra-SACU trading system.

The systematic literature review (SLR) that follows in this study will serve to corroborate, refine or challenge these preliminary assessment, offering a more evidence-based assessment of the sustainability of intra-SACU trade.

The remainder of this chapter provides a contextual overview of the SACU in terms of trade, infrastructure and logistics performance.

2.8 Contextual overview

2.8.1 Overview of SACU trade

Intra-SACU trade plays a crucial role in maintaining economic stability, particularly for landlocked member states that are heavily reliant on imports from South Africa. In 2023, intra-regional trade in the SACU totalled R281.3 billion (SACU, 2024). As mentioned, numerous times in this study, a large proportion of intra-SACU goods are transported via road freight, a sector expected to grow significantly in the coming years (EXIM, 2018: 9–21; Vilakazi, 2021: 2–18; Mahlangu, 2024).

South Africa is the SACU's leading trading partner. In 2023 alone, South African exports to SACU amounted to R194.27 billion (SACU, 2025:12). Its economic dominance (representing 90% of SACU's GDP) (Ndzama, 2025:271–273; McCarthy, 2014:5–6), however, has created an unbalanced trade ecosystem. While Member States (Botswana, Lesotho, Namibia and Eswatini—collectively referred to as BLNE) benefit from duty-free access to South Africa's diversified market, their dependence

on revenue transfers through the SACU revenue-sharing formula (which contributes up to 40% of BLNE countries' government revenue) highlights an underlying asymmetry (Ndzama, 2025:271; Stats SA, 2020; Draper *et al.*, 2007:16–19). This structure, while supportive in the short term, perpetuates dependency and hinders the development of independent, value-added industrial sectors in smaller economies.

2.8.2 Overview of the SACU Infrastructure

As seen in chapter one, the state of road infrastructure across the SACU reflects both progress and persistent challenges. South Africa has the largest and most developed network in the region, valued at over R2.1 trillion, but it faces severe deterioration due to under-maintenance, overloading and budget constraints. Provincial and rural roads are particularly at risk, with backlogs requiring hundreds of billions of rands to address. Since road freight is the dominant mode of transport for intra-SACU trade, carrying the bulk of agricultural goods, manufactured products, mining outputs and retail goods across borders, the decline of road networks has a direct and disproportionate impact on trade flows. Poor road quality increases vehicle operating costs, prolongs transit times, raises accident risks and reduces the reliability of supply chains—all of which undermine the competitiveness of the SACU Member States in both regional and international markets.

As pointed out in chapter one, similar concerns extend across the union: while Botswana and Namibia boast well-developed highways that support mining and tourism, they too face deterioration and rural access gaps that restrict broader economic linkages. Lesotho's mountainous terrain makes road construction and maintenance prohibitively expensive, leaving many communities and trade routes poorly connected, while Eswatini maintains its core network but faces financial constraints that limit upgrades and expansion. Across the region, these infrastructure shortcomings obstruct the seamless movement of goods, increase trade costs and weaken the effectiveness of regional integration efforts. Without significant investment in road networks, the sustainability of intra-SACU trade remains at risk, as the region's most critical transport mode continues to operate below its potential.

The following section uses existing infrastructure performance indicators in the SACU to provide a better empirical overview of SACU's infrastructure challenges.

2.8.3 Infrastructure performance indicators in the SACU

To gain a comprehensive understanding of infrastructure performance within the SACU, this section will draw on established indexes that evaluate transport efficiency, logistics capabilities, and regional connectivity. These indexes are widely used in the literature as proxies for measuring infrastructure quality in the absence of detailed, region-specific datasets (Dare *et al.*, 2019; Harmon, 2015:8-9).

The indices included within this study include the World Economic Forum's Global Competitiveness Index (GCI), which incorporates infrastructure as one of its pillars and measures the availability and quality of transport networks (Schwab, 2019); the World Bank's Logistics Performance Index (LPI), which assesses trade logistics efficiency across customs, infrastructure, international shipments, logistics competence, tracking, and timeliness (Bayraktar *et al.*, 2024: 1-2; Dare *et al.*, 2019; Arvis *et al.*, 2018: 8; Harmon, 2015:8-9); and the Road Quality Index by Country, which provides country-level insights into road conditions and their impact on transport efficiency (Moszoro & Soto, 2022: 3-29). The application of these indices in trade-related studies, such as this one, has been especially valuable in African contexts where official infrastructure data is fragmented, outdated, or inconsistent (Raballand *et al.*, 2012; Foster & Briceño-Garmendia, 2010: 32-36).

This section of the chapter will use the data or indicators from these indexes to benchmark SACU's performance against regional and global peers, thereby identifying critical gaps that constrain trade sustainability. To achieve this objective, it will compare the different SACU countries with one another, to the East African Community (EAC) to the broader African average, and to global standards.

The inclusion of the EAC (Democratic Republic of the Congo, Republic of Burundi, Republic of Kenya, Republic of Rwanda, Federal Republic of Somalia, Republic of South Sudan, Republic of Uganda, and United Republic of Tanzania*), as a benchmark for SACU warrants special mention. It was chosen because of its structural and economic similarities to the SACU, which make for a meaningful benchmarking exercise. For instance, like the SACU, the EAC consists of a mix of coastal and landlocked economies, with Tanzania—like South Africa—providing a critical maritime gateway through its ports to support both regional and extra-regional trade. This benchmarking is not about declaring one bloc better than the other, but about

understanding how different infrastructure profiles and development strategies impact trade outcomes.

South Africa has a relatively advanced but ageing and inefficient infrastructure network, thus experiencing impediments in terms of freight rail utilisation, port congestion and energy instability (Ndzama, 2025: 279-286). The key trade issue is not a lack of infrastructure but its quality, reliability, and cost. The EAC faces a more fundamental lack of physical connections. Key trade corridors such as the Northern Corridor: port of Mombasa to landlocked countries (LLC) such as Kampala, Uganda; Central Corridor: connecting the port of Dar es Salaam to LLCs of Burundi/Rwanda require massive new investment (Otiato, 2020).

The EAC's challenge is building new infrastructure to reduce overwhelming trade costs caused by distance and difficult geography. This comparison sheds light on whether trade performance is more sensitive to building new infrastructure (EAC) or optimising existing infrastructure (SACU). Both blocs continue to face the dual challenge of integrating strong, more diversified economies alongside smaller, landlocked members that rely heavily on overland transport for access to global markets. Botswana, Lesotho and Eswatini are heavily dependent on South African infrastructure and trade policies. Uganda, Rwanda, Burundi and South Sudan are landlocked, reliant on Kenyan or Tanzanian corridors. By comparing the trade performance indices of landlocked SACU members with a stable, dominant transit country versus landlocked EAC members with only a choice of competing transit countries, we can analyse how different infrastructure governance and political relationships impact regional trade. Moreover, the EAC, like the SACU, has made significant strides in regional integration but continues to grapple with persistent infrastructure gaps, logistical inefficiencies, and disparities among Member States (Otiato, 2020:2).

The data from these indexes will also highlight disparities among SACU member states themselves and the EAC, revealing systemic weaknesses that undermine trade facilitation and regional integration. For instance, the findings show that South Africa consistently ranks above the regional average across multiple indicators, while smaller member states such as Lesotho and Eswatini lag behind significantly. These disparities affect logistics reliability, cost competitiveness and ultimately the

sustainability of intra-SACU trade. The results of each index will subsequently be presented and discussed.

2.8.4 Global competitiveness index rankings (2015-2019)

The Global Competitiveness Index (GCI), developed by the World Economic Forum (WEF), provides one of the most comprehensive assessments of infrastructure within an economic context (DBSA, 2024:38; Schwab, 2019:19). It evaluates multiple dimensions on a scale of 0 to 100 and rankings out of 141 countries, it includes the quality and efficiency of road, rail, air and port infrastructure from 2015 to 2019.

It should be noted that its rankings were not published between 2020 and 2023, because the organisation suspended the index due to disruptions caused by the COVID-19 pandemic. As a result, the most recent available GCI data used in this study is from 2019.

According to this benchmark, and in terms of the SACU, South Africa's transport network is considered fundamentally sound; however, persistent inefficiencies in its port and rail services continue to undermine its overall performance when compared to global leaders (DBSA, 2024:38). One of the GCI's key metrics—road network efficiency, which accounts for route directness and average travel speed—highlights South Africa's relative strength. In fact, the country has gradually made efforts to improve its overall infrastructure competitiveness rankings by seven positions between 2018 and 2019, ranking 60th out of 141 nations (see Table 3) (Schwab, 2019:19). This improvement reflects significant investments in road infrastructure, which serves as a critical backbone for regional trade (Schwab, 2019:19; DBSA, 2024:38).

It should be noted that the GCI data also revealed significant intra-regional disparities within the SACU. Landlocked Member States such as Botswana, Lesotho and Eswatini remain heavily reliant on South African transport corridors for both imports and exports. This dependency exacerbates their vulnerability to South Africa's domestic logistical constraints and further reinforces structural imbalances in regional trade facilitation (Schwab, 2019:19) (see Table 3).

Table 3: Global Competitiveness Rankings 2015 - 2019.

Country	2015	2016	2017	2018	2019
SACU Member States					
South Africa	49	47	61	67	60
Botswana	71	64	63	90	91
Lesotho	113	120	131	130	131
Namibia	85	84	90	100	94
EAC Member States					
Kenya	99	96	91	93	95
Tanzania	120	116	113	116	117
Uganda	115	113	114	117	115
Rwanda	58	52	58	108	100
Burundi	136	135	129	136	135
Regional Median (Africa)	117	119.5	116	119.5	121.5
World Median	70	69	67	69.5	71

Table 3: 1Global Competitiveness Rankings 2015 - 2019. Source: World Economic Forum 2015 -2019

The SACU-EAC comparative logistics performance analysis reveals that between 2015 and 2019, the SACU generally outperformed the EAC in global competitiveness rankings. South Africa consistently held the highest position among countries in both blocs, although its ranking declined from 49th in 2015 (Schwab, 2015: 30) to 60th in 2019 (Schwab, 2019: 19). According to the World Economic Forum (Schwab, 2019:19), this drop was driven by factors such as economic stagnation, with GDP growth increasing slowly from 0.7% in 2016 to 1.2% in 2017 (World Bank, 2025a), high unemployment projected above 27%, political uncertainty and declines in institutional quality, financial markets and goods to market efficiency. While South Africa continued to perform well in areas like financial infrastructure and transport networks, its overall competitiveness was undermined by persistent challenges, including security risks, labour market rigidity, low business dynamism, and a heavy reliance on volatile mineral exports.

Botswana maintained a relatively competitive position during the same period, ranking above most EAC countries, except for Rwanda, which saw a strong performance in 2016 due to the country's investment commitment to education and skills, uplifting their human capital (Schwab, 2016: 58) but experienced a noticeable decline by 2018 due to macro-economic instability (Schwab, 2018: 489). Namibia and Kenya followed

¹ Table 3 Full data availability includes: SACU: South Africa, Botswana, Namibia, and Lesotho (Eswatini excluded). EAC: Kenya, Tanzania, Uganda, and Rwanda (DR Congo, Somalia, and South Sudan excluded).

similar trajectories, with both countries hovering close to the African regional median. In contrast, Lesotho (SACU) and Burundi (EAC), both landlocked nations, consistently ranked among the least competitive economies within their respective regions.

When comparing regional standings, the African regional median competitiveness score typically ranged between 117 and 121.5. South Africa and Botswana consistently ranked above this range, signalling stronger macro-economic fundamentals and institutional frameworks. Namibia and Kenya remained near the median, while countries such as Lesotho, Tanzania, Uganda, and Burundi fell well below it, reflecting underlying structural and policy challenges. On a broader scale, the global median ranking, which falls between 67 and 71, was reached only by South Africa, albeit with difficulty in recent years. Other SACU and EAC member states remained far below this global benchmark, highlighting a persistent competitiveness gap between African economies and the rest of the world.

In summary, SACU outperformed EAC in terms of competitiveness, largely due to the relatively stronger performances of South Africa and Botswana. In the EAC, Rwanda and Kenya stood out as the most competitive economies, while others, particularly Burundi, consistently ranked at the bottom (Otiato, 2020:46-62). Despite SACU's edge, both regional blocs face substantial challenges in achieving global competitiveness standards in terms of infrastructure development or performance. These findings underscore the critical need for infrastructure improvements, institutional reforms and policy interventions aimed at enhancing the business environment and economic performance across both unions.

2.8.5 Logistics performance indicator (2014 –2023)

One of the most authoritative benchmarks for assessing trade logistics is the World Bank's Logistics Performance Index (LPI) (World Bank, 2025b, Bayraktar *et al.*, 2024: 1-2; Dare *et al.*, 2019; Arvis *et al.*, 2018: 8; Harmon, 2015:8-9). This index evaluates countries across six key dimensions: customs efficiency, infrastructure quality, international shipment reliability, logistics competence, tracking capabilities, and the timeliness of deliveries (World Bank, 2025b). By offering a comprehensive overview of trade facilitation performance, the LPI effectively highlights the structural disparities between developed and developing economies. Notably, South Africa ranks among

the top-performing African countries, thanks to its relatively advanced transport systems and logistics services (DBSA, 2024:38; Schwab, 2019:19). According to this benchmark, the overall performance of the SACU region remains below global averages, largely due to significant infrastructure and logistical limitations in smaller Member States such as Lesotho and Eswatini. These disparities not only weaken SACU's collective trade capacity but also underscore the urgent need for targeted investment to close intra-regional infrastructure gaps and enhance trade efficiency.

Table 4: Logistics Performance Index - 2014 to 2023

Country	2014	2016	2018	2023
SACU member states				
South Africa	3.43	3.78	3.38	3.7
Botswana	2.49	3.05	2.88*	3.1
Lesotho	2.37	2.03	2.28	2.22*
Namibia	2.66	2.74	2.76*	2.9
EAC member states				
Kenya	2.81	3.33	2.81	2.98*
Democratic Republic of the Congo	2.08	2.38	2.49	2.5
Rwanda	2.76	2.99	2.97	2.8
Burundi	2.57	2.51	2.06	2.38*
Somalia	1.77	1.75	2.21	2.0
South Sudan	2.16	2.53	2.43	2.4
Regional Median (Africa)	2.47	2.49	2.46	2.48
World Median	2.89	2.88	2.87	3.0

Table 4:2 Logistics Performance Index - 2014 to 2023. Source: World Bank

The below formula relates to table 5 and calculates the average LPI score for Africa to establish a continental benchmark. It aggregates the median LPI scores of all African countries with available data from the World Bank reports for 2014, 2016, 2018, and 2023 (see Table 4). The result is a single composite average, which serves as a reference point to compare the performance of regional blocs like the SACU and EAC against the overall African median. These averages offer a valuable benchmark for assessing the trade facilitation capabilities of regional blocs such as the SACU and the EAC, allowing for clearer comparison of performance trends and infrastructure efficiency over time.

² Table 4: Countries with consistent LPI data:

SACU: South Africa, Botswana, Namibia, Lesotho

EAC: Kenya, Democratic Republic of Congo, Rwanda, Somalia, South Sudan

Excluded due to missing data: Eswatini (SACU), Uganda and Tanzania (EAC).

$$\frac{\text{Total sum of all African countries LPI scores}}{\text{Total African countries}} = \text{Average LPI Score}$$

Table 5: African Average Logistics Performance Index - 2014 to 2023

Year	Total African countries	Total Sum of LPI scores	Average LPI score
2014	46	113.556918	2.47
2016	46	114.505	2.49
2018	45	110.63	2.46
2023	28	69.4	2.48

Table 5: African Average Logistics Performance Index - 2014 to 2023. Source: World Bank

The most striking observation from Table 4 is the consistent stagnation of the average LPI score for Africa. Over nearly a decade, this average score has fluctuated within a narrow range of 2.46 to 2.49. This trend suggests that while performance has not significantly declined, there has also been no meaningful improvement across the continent in its entirety still falling below world averages. The LPI is scored on a scale from 1 (worst) to 5 (best), and an average score of 2.48 indicates a persistent challenge, highlighting a substantial gap in logistics efficiency and infrastructure. Notably, this score is 0.38 points higher than the lowest-performing countries, which have an LPI score of 2.1, but still lags behind higher-performing regions globally (World Bank, 2023:2).

A major red flag is the sharp decline in the number of reporting countries in 2023, which dropped from 45 or 46 in previous years to just 28. This reduction has critical implications. The 2023 average score of 2.48 is based on a much smaller and potentially non-representative sample of African nations. It is possible that only countries with stronger logistics systems or better data-collection capabilities reported their scores, which could artificially inflate the average. This lack of data makes it challenging to accurately assess the true impact of recent global events, such as the COVID-19 pandemic and supply chain disruptions, on African logistics performance (World Bank, 2023).

Nevertheless, this data provides a continental benchmark for the study. The consistent averages from 2014 to 2018, based on a stable number of countries, establish a reliable baseline of 2.47. This benchmark is crucial for comparing the performance of regional blocs, such as SACU or the EAC, against the continental norm.

Analysis of the Logistics Performance Index

An analysis of the Logistics Performance Index data (see Table 4) reveals that between 2014 and 2023, SACU countries generally outperformed the EAC in logistics efficiency, with South Africa leading both regions. South Africa consistently maintained an LPI score above 3.3, signifying robust trade logistics infrastructure (World Bank, 2023: 53). Botswana and Namibia also performed well, with Botswana notably improving its score from 2.49 in 2014 to 3.1 in 2023, in the process surpassing Kenya, Rwanda and other top-performing members of the EAC.

In contrast, Kenya and Rwanda, while leading the EAC, still had scores lower than those of most SACU countries. For example, Rwanda's LPI declined slightly from 2.99 in 2016 to 2.8 in 2023. This was due to Rwanda's high volatility of trade costs, which weakened the predictability and confidence required for the development of RVCs (World Bank, 2022). Internal trade within Rwanda also remains costly due to the rugged terrain and weaknesses in infrastructure. The weakest performers in each union were Lesotho (from the SACU) and Somalia and Burundi (from the EAC), all of whom consistently scored below 2.5, indicating severe logistical challenges.

When compared to the African regional median, which ranged from 2.47 to 2.49 over the years, South Africa, Botswana, Namibia, Kenya and Rwanda consistently scored above this benchmark, demonstrating relatively stronger logistics performance. In contrast, while Lesotho, Burundi, and Somalia fell below the regional median, highlighting their logistical inefficiencies.

On a global scale, with the median ranging from 2.87 to 3.0, South Africa consistently outperformed global levels. Botswana and Namibia are also expected to improve, reaching similar global benchmarks by 2023. While Kenya and Rwanda showed progress within the EAC, they remained slightly below the global median, with other EAC countries continuing to struggle with weak logistics performance.

Consequently, the SACU countries generally possess stronger logistics infrastructure and trade facilitation compared to EAC countries, mainly due to South Africa's advanced logistics sector. Botswana's steady improvement also reflects growth within the SACU. Meanwhile, Kenya and Rwanda show potential within the EAC, but the rest of the region faces significant logistical inefficiencies. Although some SACU members,

such as South Africa, Botswana and Namibia, are approaching global competitiveness, both customs unions still require substantial investment in infrastructure and trade facilitation to enhance their international trade performance.

2.8.6 Road Quality Index by Country (2017 – 2019)

In addition to these global indices, the Road Quality Index (RQI), published by the World Economic Forum (WEF, 2025), provides an in-depth assessment of both national and urban road conditions, which are crucial for ensuring transport efficiency and safety. The quality of road infrastructure of the SACU varies. Still, South Africa stands out with comparatively better road conditions than its regional counterparts (Schwab, 2019: 19), despite Namibia receiving regional praise for its efforts in road development.

The Road Quality Index employs a methodology based on a Quality of Road Infrastructure (QRI) score, derived from a 2019 survey of business leaders from 144 countries (WEF, 2025). These leaders rated road quality on a scale from 1 (under-developed) to 7 (extensive and efficient by international standards) (Moszoro & Soto, 2022: 3). Additionally, the Mean Speed Score, used by the International Monetary Fund and based on 2022 data, measures cross-country road quality by analysing travel times between major cities via Google Maps. This score closely aligns with the World Bank's Rural Access Index and the World Economic Forum's Quality of Road Infrastructure score, reinforcing its value as an accurate indicator of road quality and accessibility. In both indicators, higher scores are clearly preferable (Moszoro & Soto, 2022: 4-5).

Assessing road quality is essential for understanding national infrastructure and various countries have received QRI scores based on surveys regarding their transportation systems. In the context of the SACU, the latest global road quality statistics, as of June 2024, will be explored in further detail. These assessments are crucial for identifying areas in need of improvement and understanding the regional disparities that affect trade efficiency and economic integration.

This approach enhances the understanding of SACU's road infrastructure and provides additional insights into how road quality impacts regional competitiveness and trade facilitation.

Table 6: WEF and World Bank Road quality data

Country	2015	2017	2019	IMF speed score
SACU member states				
South Africa	4.93	5.03	4.27	100
Botswana	3.98	4.13	3.64	91
Lesotho	3.33	3.20	2.41	60
Namibia	5.20	5.15	5.09	99
EAC member states				
Kenya	4.22	4.19	4.22	47
Uganda	3.20	3.48	3.53	64
Rwanda	4.68	4.99	4.70	47
Burundi	3.24	2.87	2.96	51
Tanzania	3.03	3.44	3.53	57
Regional Median (Africa)	3.45	3.56	3.49	66.3
World Median	4.14	4.22	4.08	74.6

Table 63: WEF and World Bank Road quality data Source: World Bank

An analysis of the RQI data (see Table 6) reveals an apparent disparity between the SACU and the EAC, with SACU members demonstrating significantly superior road infrastructure. Namibia and South Africa are the regional standouts, with road quality scores that not only lead their respective unions but also surpass both African and global benchmarks.

Within SACU, Namibia consistently recorded the highest QRI scores, achieving above 5.0 across all measured years from 2015 to 2019, complemented by a near-perfect IMF Mean Speed score of 99. South Africa also exhibited a strong and stable performance, with QRI scores hovering around 5.0 before a notable dip in 2019, although it maintained a perfect IMF Speed score of 100. This reflects not only well-maintained road surfaces but also an efficient network design, including highways and bypasses that reduce travel time between urban centres. This aligns with the finding that MS scores are higher in countries with better road quality and greater economic development (Moszoro & Soto, 2022: 12). Botswana's road quality, while lower than that of its SACU peers, remained respectable and above the African median. In stark contrast, Lesotho trails significantly behind, with the lowest scores in the group, indicating significant infrastructural challenges.

³ Table 6 Due to data availability, the analysis includes the following countries:
SACU: South Africa, Botswana, Namibia, and Lesotho (Eswatini is excluded).
EAC: Kenya, Uganda, Burundi, Rwanda, and Tanzania (DRC, Somalia, and South Sudan are excluded).

In the EAC, Rwanda posted the strongest QRI scores, rivalling and even briefly surpassing those of Botswana. However, this is not reflected in its IMF Mean Speed score of 47, suggesting potential issues with road network efficiency, density or connectivity, despite high-quality primary roads. Kenya also demonstrates relatively good road quality with stable QRI scores above 4.0. The remaining EAC members—Uganda, Tanzania and Burundi all have QRI scores below the African median, with Burundi consistently being the weakest performer. The low IMF speed scores across all EAC members (ranging from 47 to 64) further underscore the region's challenges with road efficiency and travel times indicating systemic challenges in road connectivity, congestion or surface conditions that impede travel efficiency. The low IMF score above suggests that while primary roads may be in good condition, the overall network may lack density, connectivity or sufficient high-speed corridors, a discrepancy that echoes the IMF's caution that road quality is multi-dimensional and not fully captured by perception-based surveys alone (Moszoro & Soto, 2022: 3).

When compared to the African regional median QRI (3.5), all SACU members except Lesotho performed well above average. In the EAC, only Rwanda and Kenya exceeded this regional benchmark. The gap to the world median QRI (4.1) is more visible as only Namibia and South Africa consistently met or exceeded this global standard, highlighting a significant infrastructure divide.

The IMF Mean Speed scores reinforce this conclusion. The SACU average is markedly higher than the EAC's, directly indicating faster and more efficient road transport between major cities—a critical factor for trade and logistics. South Africa and Namibia's scores (100 and 99 respectively) are competitive on a global scale, while all EAC countries fall substantially below the world median speed score of 74.6.

Consequently, SACU countries, driven by Namibia and South Africa, possess a significant advantage in road infrastructure quality and efficiency over their EAC counterparts. This superior network facilitates stronger regional connectivity and trade integration within Southern Africa. While Rwanda and Kenya show potential within the EAC, the region overall requires substantial investment to improve both the quality and operational efficiency of its road networks to enhance trade facilitation and economic growth. As Africa works to strengthen trade integration, improving road

quality will be essential for enhancing intra-regional connectivity, reducing logistics costs, and boosting economic competitiveness.

2.9 Identification of current gaps in literature

The literature review that was employed for this study revealed some significant gaps and these gaps are important to note, because the rest of this study (the systematic literature review) addresses these gaps. For instance, while earlier studies have looked at trade openness, policy changes and overall economic performance (Nangombe, 2024; Malefane & Odhiambo, 2017), they often miss the crucial impact of physical infrastructure on regional trade. For example, research by Safaeimanesh and Jenkins (2021) dives into administrative trade barriers like customs delays, but it does not really tackle how issues like cross-border transport networks, port congestion and the quality of roads can directly hinder trade. This is significant, especially considering evidence from Vilakazi (2018) showing that just border delays can hike transport costs by 10–30%. Plus, Mlepo (2022) points out that attacks on freight trucks can seriously disrupt essential supply chains. This study intends to connect the dots between infrastructure shortcomings and trade performance, moving the conversation away from the broader economic analysis seen in Lee *et al.* (2024) to focus on the specific logistical challenges at play.

Secondly, a persistent disconnect seems to exist between trade policy assumptions and infrastructure realities within SACU. Many studies (McCarthy, 2014; Obasaju *et al.*, 2021) presume that trade agreements automatically enhance integration, yet they rarely consider whether the existing infrastructure can support increased trade volumes. This is especially problematic given SACU's heavy reliance on South Africa's transport networks, which create significant bottlenecks for landlocked members like Botswana and Lesotho. The current research directly addresses this oversight by analysing how weak transport corridors and uneven infrastructure development undermine trade agreements while advocating for infrastructure-integrated policy approaches.

Thirdly, the predominant focus on economic indicators such as GDP growth and trade volumes has often overshadowed social and environmental considerations. As Vilakazi (2018) shows, high freight costs disproportionately affect landlocked SACU

economies, worsening regional inequalities. Mlepo (2022) further reveals how logistics disruptions harm cross-border livelihoods. Although Lalendle *et al.* (2021) touch on transport emissions, it fails to connect these issues to broader concerns regarding trade sustainability. Section 2.6 of this study briefly introduces the aim intended to be used to expand the analytical framework of incorporating a triple-bottom-line approach that assesses trade sustainability across economic, social and environmental dimensions.

Fourthly, a significant gap highlighted in the current research seems to be the absence of standardised valuation frameworks to evaluate policies, investments and the overall health of the freight transport system within the union, and this would ensure that the union's valuation of its freight transport sector is comprehensive, sustainable and aligned with modern economic thinking, directly addressing the challenges outlined above in this chapter. While studies like those of Tandrayen-Ragoobur *et al.* (2022) and Lalendle *et al.* (2021) recognise the importance of infrastructure, they all lack actionable SACU-specific metrics that this paper proposes. Other articles investigate the SACU's Regional Integration Index, which includes infrastructure components (Woyo & Tafirenyika, 2025), but do not analyse trade impacts and Vilakazi's (2018) recommendations for regulatory harmonisation remain largely theoretical. This study directly addresses this limitation by adopting a systematic literature assessment model that enables policymakers to evaluate the role of infrastructure in trade sustainability and the challenges encountered through an evidence-based metric.

Fifthly, current policy recommendations also suffer from a disconnect between trade facilitation and infrastructure development. As shown by Malefane and Odhiambo (2017) and Nangombe (2024), proposals often prioritise trade liberalisation over structural investments. This neglect continues despite clear evidence from McCarthy (2014), Vilakazi (2018) and others that measures (like single-window systems and risk-based customs checks) cannot compensate for inadequate physical infrastructure. In response, therefore this study advocates for more integrated solutions, such as regional infrastructure funding (McCarthy, 2014), cross-border security cooperation (Mlepo, 2022) and green transport strategies (Lalendle *et al.*, 2021) that address both policy and structural barriers.

Lastly, the scattered nature of current research economics, trade and infrastructure really exacerbates these problems. Economic studies (Lee *et al.*, 2024) often miss important infrastructure factors, while logistics research (Vilakazi, 2018; Mlepo, 2022) tends to ignore connections to trade policy. On top of that, sustainability frameworks (Lalendle *et al.*, 2021) are often out of touch with trade analysis related to the SACU. This study aims to tackle this fragmentation by performing a qualitative systematic review that brings together macro-economic trade data, detailed logistics research and sustainability evaluations into a unified analytical framework. In doing so, it provides a thorough understanding of how infrastructure limitations affect intra-SACU trade from multiple angles.

In summary, this research contributes six key insights to the existing trade-infrastructure literature. Firstly, it shifts the focus from abstract trade policy to tangible infrastructure constraints; secondly, it establishes empirical links between infrastructure deficits and trade performance; thirdly, it aligns trade agreements with the realities of existing physical infrastructure; fourthly, it incorporates socio-environmental factors into sustainability assessments; fifthly, it recognises the need for standardised evaluation frameworks; and sixthly, it advocates integrated policy solutions. By systematically consolidating existing knowledge, this study provides both analytic tools and targeted solutions, ensuring that future trade policies are rooted in the infrastructural realities that fundamentally influence SACU's trade sustainability. Through addressing these interconnected gaps, the research lays the groundwork for more resilient, equitable and sustainable growth in intra-SACU trade that benefits all Member States.

Chapter 2: Summary and conclusion

This chapter examined the foundational role of trade theory and infrastructure in shaping SACU. It established that while regional integration and trade openness provide significant benefits, the union's practical performance is heavily constrained by critical infrastructural deficits. The analysis revealed that intra-SACU trade, though substantial, is overwhelmingly driven by South Africa and relies almost exclusively on road freight. This dependency is compounded by ageing, poorly maintained networks and persistent border bottlenecks, which increase costs and create unpredictable delays, undermining the efficiency gains from trade-facilitation policies.

To unlock SACU's full potential, the chapter concludes that a coordinated strategy is essential. This strategy must align trade policies with targeted physical infrastructure upgrades in roads, rail, and ports, financed through other mechanisms. Furthermore, deeper regional cooperation, including linkage with the AfCFTA, is crucial. The review simultaneously identified a key gap in existing literature: while prior studies focus on trade liberalisation, they often neglect the concrete impact of infrastructure mismatches and broader socio-environmental sustainability. This oversight highlights the need for an integrated analytical framework that better reflects the logistical realities on the ground, setting the stage for the methodological approach outlined in the next chapter.

Chapter 3: Research design and methodology

3.1 Introduction

Building on top of the critical research gaps identified in Chapter 2, particularly the fragmented analysis of infrastructure-trade linkages and the absence of an integrated sustainability framework, this chapter details the methodological approach designed to address these shortcomings. To move beyond the prevailing, often disconnected perspectives on intra-SACU trade, this study employs a Systematic Literature Review (SLR). This rigorous method is selected specifically to consolidate the multifaceted evidence base; test established assumptions against logistical realities and construct a more holistic understanding of the factors shaping sustainable regional trade.

The following sections outline the SLR process, explaining its structured protocol for identifying, evaluating, and synthesising relevant academic, policy, and institutional literature.

3.2 Systematic literature review

A **systematic literature review (SLR)** is a structured approach to examining the existing research on a topic. Unlike a regular review, it follows clear steps—such as setting up a plan, conducting a thorough search and carefully selecting which studies to include—so that the results are both transparent and reliable (Page *et al.*, 2021: 6; Tranfield *et al.*, 2003). The main benefit is that it reduces personal bias and makes it easier for others to see how the conclusions were reached. It also helps to map out where research agrees, where it disagrees and what gaps still exist (Snyder, 2019: 334-339; Rojon *et al.*, 2021: 208).

In international trade and regional integration, SLRs have been used to pull together evidence on how logistics influence trade performance (Salawu & Hassan, 2022), to check whether exports really drive economic growth (Kulinska, 2024) and even to study how regional integration is being shaped by new tools like machine learning (De Lombaerde *et al.*, 2023). They have also been applied to review integration processes such as the Pacific Alliance in Latin America (Canovas Roque *et al.*, 2025). In short, SLRs are useful because they take scattered studies and fuse them into one clear picture that can guide both research and policymaking.

As mentioned in chapter one, an SLR was chosen for this study because it allows us to build a clear and reliable picture from existing research where reliable data are lacking. In the SACU region, detailed and consistent information on road infrastructure quality and its effect on trade is scarce, especially for smaller members like Lesotho and Eswatini. An SLR makes it possible to bring together scattered evidence on infrastructure, trade dynamics, and sustainability, rather than relying on incomplete or misleading datasets. This approach also avoids oversimplifying trade performance by recognising that poor roads interact with many other factors like border delays, regulations and customs inefficiencies. In doing so, the SLR provides a structured way to capture what is already known, expose the gaps and give a more holistic understanding of how infrastructure challenges shape the sustainability of intra-SACU trade.

The SLR methodology is uniquely suited for this study (analysing intra-SACU trade sustainability) due to three key reasons. Firstly, SACU's complex trade dynamics and infrastructure deficits (for example: road congestion, cross-border delays) involve fragmented, multi-disciplinary evidence (economics, logistics, policy). Systematic review's exhaustive search and thematic synthesis can integrate diverse sources and academic studies, grey literature, and local case studies to map the challenges holistically. Secondly, its rigorous quality assessment and protocol-driven transparency mitigate bias when evaluating conflicting evidence (for example the effectiveness of infrastructure investments), ensuring that findings are credible for policymakers. Thirdly, this is affected by emphasizing pragmatic outputs such as context-specific guidelines for enhancing trade routes or priorities for infrastructure upgrades. The methodology bridges academia and practice, directly addressing SACU's need for evidence-based solutions tailored to varied national contexts (landlocked Eswatini vs. coastal South Africa). This structured approach transforms scattered data into actionable strategies for sustainable regional trade.

3.3 Research design and methodology

3.3.1 Research design

This study adopts a qualitative research design, operationalised through a Systematic Literature Review (SLR). The process follows the established protocol of Tranfield *et al.* (2003), structured into three key stages to ensure rigor and transparency:

Planning: Defining the review's scope, research questions, and search strategy.

Executing: Conducting systematic searches across academic and institutional databases, followed by the screening and selection of literature based on predefined inclusion/exclusion criteria.

Disseminating: Synthesizing the findings through a narrative synthesis and critical evaluation to address the research aims.

The literature review focuses on published academic articles, government reports, institutional publications and other relevant documents that explore the intersections of infrastructure, trade sustainability and economic integration within the SACU. It only focuses on literature published between 2010 and 2025. This timeframe is critical as it captures developments that occurred after the global financial crisis, significant SACU policy shifts (including engagements with AfCFTA), major regional infrastructure initiatives, post-pandemic initiatives and the evolving impact of climate change and security threats on transport corridors.

The rest of this process includes data collection, the identification of key search terms, screening and selection process which will provide the foundation for the inclusion and exclusion criteria and the data analysis process. Each one of these steps will subsequently be explained.

3.3.2 Data collection

The first step involves the data collection. Data collection for this study involved a thorough and systematic online literature search for relevant literature across multiple academic databases and institutional sources. The primary databases utilized are JSTOR, ScienceDirect, EbscoHost, Web of Science, Scopus and Google Scholar,

complemented by reports and documents from the SACU, regional trade organizations and relevant government agencies. As mentioned, the period of focus for this review spans from 2010 to 2025 to ensure the inclusion of the most recent findings on the topic.

3.3.3 The identification of key search terms

The second step involves the identification of key search terms. The key search terms used for this study were informed by the research questions (as outlined in chapter 1) and include the following:

Table 7: SLR Key search terms

Key search terms	
• Southern African Customs Union	• Roads, railways, ports, bridges
• SACU	• Infrastructure Issues
• intra-SACU trade	• Infrastructure challenge
• Botswana, Eswatini, Lesotho, Namibia and South Africa	• Infrastructure deficit*
• Infrastructure	• Infrastructure constraint
• Transport infrastructure	• Infrastructure gap
• Trade facilitation	• Infrastructure bottleneck
• Infrastructure quality	• Performance and Impact
• Infrastructure development	• Logistic performance
• and 7 and they demonstrate how Boolean operators were used to systematically identify relevant sources	• Trade volume
• Trade barrier	• Regional integration
• Sustainability	• Regional cooperation
• Regional trade	• Government policy
• Policy framework	• Global average

Table 7: SLR Key Search Terms

These key searches are presented in Tables 7 AND 8, and they show how Boolean operators were used to identify relevant sources systematically. A Boolean operator is a simple word or symbol (like **AND**, **OR**, **NOT**) used to connect keywords when you search in databases, search engines, or library catalogues. Boolean operators are fundamental tools for constructing precise search strings, enabling researchers to combine, exclude or broaden terms to control the scope and focus of their queries within digital databases (Aliyu, 2017). This technique is highly efficient, as demonstrated empirically by Aliyu (2017), who found that Boolean search strings

screen out a significant majority of irrelevant documents (77-99%) and achieve this with greater speed compared to simple free-text queries.

The application of this technique is a cornerstone of the rigorous methodology for SLRs advocated by Tranfield *et al.* (2003). Within their framework, using Boolean operators are not merely a search hint but are essential for executing a comprehensive, structured search using predetermined keywords and search strings (Tranfield *et al.*, 2003:213). This approach is critical for achieving the transparency, replicability, and reduced bias that define a true SLR, moving beyond the implicit methods of data collection (Tranfield *et al.*, 2003:209) characteristic of traditional narrative reviews. The structured search strategy, built on Boolean logic, must be detailed in a review protocol to ensure the systematic and auditable nature of the SLR process. They help refine and control search results:

- **AND** – narrow the search by finding results that include all the terms (e.g., trade AND infrastructure).
- **OR** – broaden the search by finding results that include any of the terms (e.g., road OR transport).
- **DO NOT** – exclude terms you do not want (e.g., trade NOT agriculture).

In short, Boolean operators make searching more precise and efficient, especially when working with large volumes of academic literature.

Table 8: Application of Boolean operators with key search terms

Primary research question			
		Primary Targeted Search Terms	
	How do existing infrastructure challenges affect the sustainability of intra-SACU trade?	Google Scholar	"intra-SACU trade" OR sustainable OR ("infrastructure challenge" OR "infrastructure deficit*" OR "regional trade" "infrastructure constraint" OR "infrastructure gap" OR "infrastructure bottleneck" OR "logistics performance" OR "transport infrastructure" OR "trade facilitation infrastructure" "Southern African Customs Union" AND "regional trade" AND "Sustainability
		Results	302
		JSTOR	"intra-SACU trade" (infrastructure challenge) AND ("Southern African Customs Union" AND "SACU") AND (transport infrastructure) AND (SACU) AND (Sustainability)
		Results	11
		EbscoHost	("southern African customs union" OR SACU) AND (sustainability OR infrastructure OR bridges OR roads OR railways OR ports)
		Results	24
		Web of Science	"Southern African customs union" OR SACU (Abstract) and sustainability OR infrastructure OR bridges OR roads OR railways OR ports
		Results	8
		Scopus	"Southern African Customs Union" OR SACU AND (sustainability) OR (infrastructure OR bridges OR roads OR railways OR ports)
		Results	14
		ScienceDirect	Intra-SACU trade AND infrastructure challenge AND transport infrastructure AND SACU AND Sustainability
		Results	11
Secondary research questions			
		Targeted Search Terms	
1.	What are the key infrastructure challenges currently faced by SACU member countries?	SACU OR Southern African Customs Union AND Botswana, Eswatini, Lesotho, Namibia, South Africa AND infrastructure challenges	
2.	How does infrastructure quality vary among SACU member countries and compare to regional and global benchmarks?	The SACU OR Southern African Customs Union AND infrastructure quality OR infrastructure development AND disparity OR variation OR Botswana, Eswatini, Lesotho, Namibia, South Africa AND infrastructure quality The SACU OR Southern African Customs Union AND Botswana, Eswatini, Lesotho, Namibia, South Africa AND infrastructure quality AND global average	
3.	How do road infrastructure deficiencies in SACU (given its importance) impact trade flows between member countries?	The SACU OR (Southern African Customs Union) AND Road infrastructure AND road transport AND bottleneck AND road quality AND trade flow impact AND Botswana, Eswatini, Lesotho, Namibia, South Africa AND trade volume AND trade barrier	
4.	What roles do government policies and regional agreements play in addressing infrastructure challenges within SACU?	SACU OR Southern African Customs Union AND infrastructure challenge AND infrastructure development AND government policy AND regional integration AND policy framework AND regional cooperation	

Table 8: Research questions and Boolean operators

Screening and selection

The third step is the screening and selection process which is a vital step for the SLR. It is important to clearly identify inclusion and exclusion criteria for the literature, as this ensures transparency, consistency and the credibility of the review process. The inclusion criteria prioritise peer-reviewed publications, government and institutional reports and other scholarly works that examine infrastructure-related issues in the context of SACU trade and economic integration. Sources not focused on the SACU region or infrastructure development, as well as non-English publications and grey literature (unless highly relevant), have been excluded from the review. The following section provides a summary of the inclusion and exclusion criteria used for this review.

The inclusion criteria prioritise:

- Peer-reviewed publications, books, and reputable institutional reports.
- Studies addressing SACU member states or regional trade in Southern Africa.
- Research linking infrastructure to trade sustainability.
- Publications between 2010 and 2025.
- Studies analysing the economic or policy impacts of infrastructure on trade flows and integration.

The exclusion criteria rule out:

- Studies unrelated to the SACU or Southern Africa.
- Articles not addressing infrastructure issues or trade impact.
- Non-English publications.
- Grey literature (unless highly relevant to the research questions).

Interpretation of Figure 3

Figure 3 is a PRISMA flow diagram, which is a standardised chart commonly used in systematic literature reviews to illustrate the process of identifying, screening and selecting scholarly articles. It visually summarises this study's journey from a large pool of initial search results to the final relevant studies included in the analysis of the study.

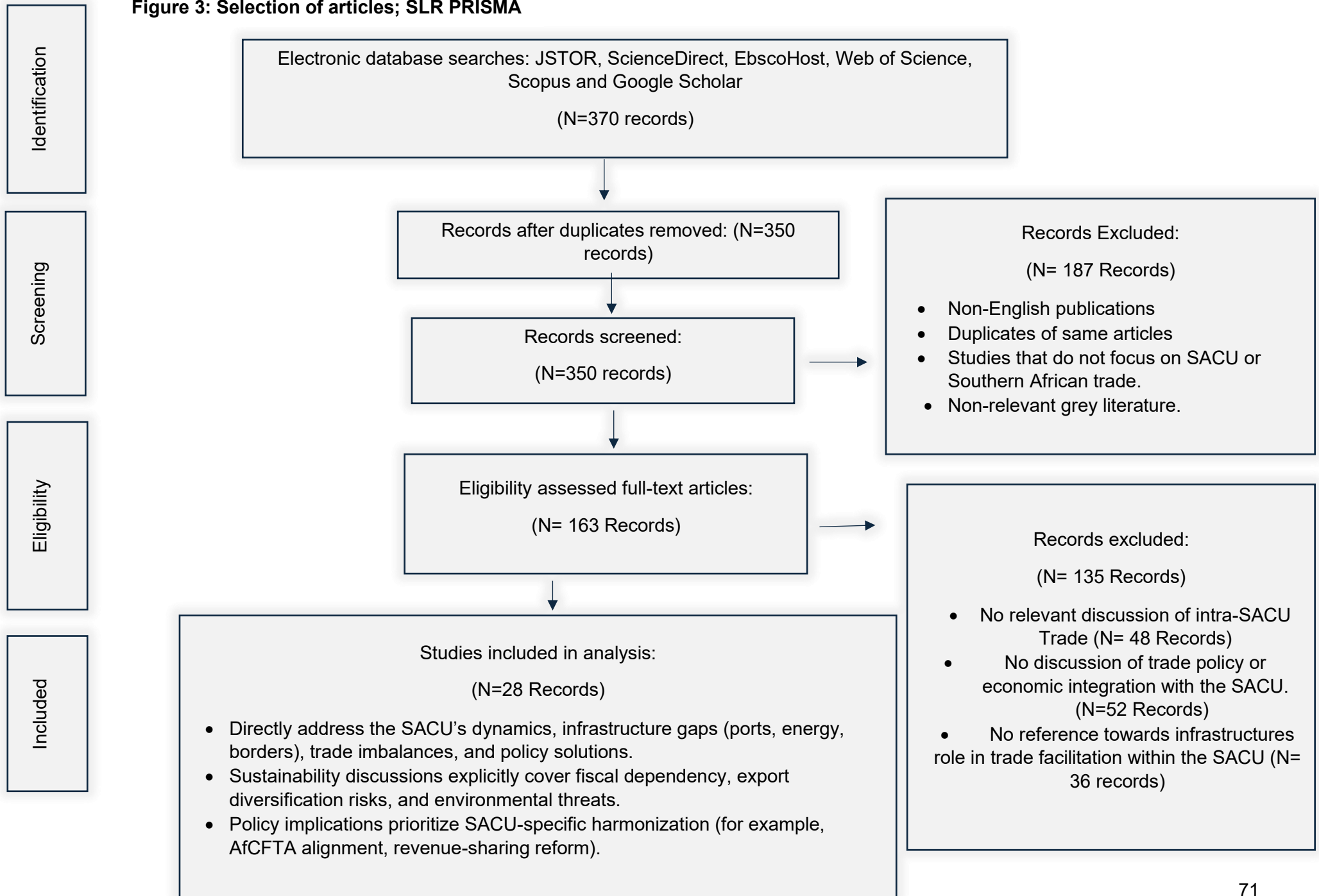
Identification: The process began with a comprehensive search across six major academic databases: JSTOR, ScienceDirect, EbscoHost, Web of Science, Scopus and Google Scholar. This search yielded a total of 370 records.

Screening: After removing 20 duplicate records, 350 remained. The titles and abstracts of these 350 records were screened based on specific exclusion criteria. As a result, 187 records were excluded for several reasons, including: not being in English; being duplicates overlooked during the initial pass; not focusing on SACU or Southern African trade (a key criterion); and representing non-relevant grey literature.

Eligibility: The 163 remaining records were considered potentially relevant and were obtained for full-text assessment.

Inclusion: Following a thorough review of the complete texts, only 28 studies met all the strict inclusion criteria necessary for the final analysis. These criteria were specifically aligned with the research topic: the articles had to directly address SACU's dynamics and infrastructure gaps (such as ports, energy and borders); discuss trade imbalances and potential policy solutions; cover sustainability aspects (including fiscal dependency, export diversification and environmental threats); and present policy implications that were specific to the SACU. A significant number of records (135) were excluded at this full-text stage, primarily because they did not adequately discuss intra-SACU trade, lacked information on trade policy or economic integration, or did not reference the role of infrastructure in trade facilitation.

Figure 3: Selection of articles; SLR PRISMA



Data analysis

The fourth steps involve a data analysis process. The analysis adopted a thematic synthesis approach to assess and interpret the findings from the selected literature. The following steps guided the data analysis process:

Data extraction

Key findings from the selected literature were extracted and categorised into themes related to infrastructure challenges (e.g. road quality, transport, energy, technology, border delays and funding gaps), trade policy, trade/logistics impact, and sustainability within the SACU. This procedure enables a detailed mapping of the infrastructure factors that impact trade sustainability and integration in the region.

Synthesis of findings

A narrative synthesis was conducted to explore patterns, trends and contradictions across the selected studies. This synthesis focuses on identifying the key infrastructure challenges within SACU, examining how these challenges impede or facilitate trade and proposing strategies for overcoming these barriers. Additionally, the review explores the relationship between infrastructure development and economic integration, with a particular focus on how infrastructure affects trade costs, efficiency, and competitiveness within SACU.

Critical evaluation

Each selected study was critically evaluated based on its contribution to the understanding of the sustainability of intra-SACU trade. This evaluation focused on the methodologies used in each study, the robustness of their findings and any limitations they present. Studies that provide empirical data or offer actionable policy recommendations for addressing infrastructure challenges were prioritised in the synthesis.

To guide the data analysis, the following sub-sections were used:

Table 9: Thematic findings

Sub-section	Focus area examples
3.5.1 Infrastructure challenges	Road quality, transport, energy, technology, border delays and funding gaps
3.5.2 Trade impact	Costs of delays, port congestion, non-tariff barriers and trade diversion
3.5.3 Sustainability	Environmental impact, employment shift and regional inequalities
3.5.4 Policy implications	Single-window customs, public-private partnerships and corridor upgrades

Table 9: Critical evaluation examples

Table 9 characterises the main thematic findings from the SLR, categorising them into four distinct yet interconnected sub-sections. While each focus area examines a different dimension of infrastructure challenges and trade impacts to sustainability and policy implications, they collectively explore the various sides of the same overarching themes, providing a comprehensive framework for quality assessment analysis.

Quality assessment

The fifth step involves a quality assessment. To ensure credibility, a **dual assessment strategy** was applied, combining **Scopus quartile rankings** with **reputability criteria** for non-quartile sources. This is explained.

- **Quartile-based assessment:** Scopus Q1 and Q2 journals are weighted more heavily as they represent the highest academic standards. (Table 10 summarises these rankings).
- **Beyond quartiles:** Some valuable research lies outside high-ranked journals, such as government reports, working papers and think-tank publications. To avoid **publication-bias** such sources have been evaluated using criteria including:
 - Authoritative source (e.g., SACU Secretariat, Afreximbank, CSIR).
 - Clear methodology and transparency.
 - Relevance to SACU trade and infrastructure.
 - Policy uses or citation evidence.

This balanced weighting ensures that the review captures both rigorous academic debates and the practical, policy-oriented insights critical for understanding infrastructure challenges in SACU. Table 9 illustrates how these criteria were applied.

Table 10: Quartile-based assessment of SLR literature

No	Article	Journal/Book/Source	Quartile	Contribution
1.	South Africa's economic progress: Challenges and opportunities for sustainable development (Enaifoghe et al., 2021).	International Journal of Development and Sustainability	Q4	Policy implications
2.	The Prospect of the Proposed Currency Union on Intra-Regional Trade: Southern African Customs Union (Abban, 2020).	Journal of Applied Economic Sciences	Q4	Policy implications
3.	The dynamics of regional economic integration: A system dynamics analysis of pathways to the development of value chains in the Southern African Customs Union (Grobbelaar & Meyer, 2017).	South African Journal of Industrial Engineering	Q3	Infrastructure challenges (with secondary links to policy implications)
4.	Socio-economic implications of South Africa's foreign direct investment in Southern African development (Umezurike et al., 2016)	Investment Management and Financial innovations	Q3	Policy implications
5.	Global market opportunities for SMEs: Export/import perception and trade growth in Lesotho (Oso & Adelakun, 2025)	Southern African Journal of Entrepreneurship and Small Business Management	Q3	Infrastructure challenges
6.	The impact of trade policies on SMEs in Windhoek, Namibia: challenges and opportunities (Sunde, 2025)	Development Southern Africa	Q2	Policy implications
7.	The changing context for regional integration in southern Africa: how adaptive are its regional institutions? (Simon, 2010)	South African Geographical Journal	Q2	Policy implications
8.	The causes of high intra-regional road freight rates for food and commodities in Southern Africa (Vilakazi, 2018)	Development Southern Africa	Q2	Policy implications and Trade impact
9.	Estimation of the potential economic welfare to be gained by the South African Customs Union from trade facilitation (Safaeimanesh & Jenkins, 2021)	South African Journal of Economic and Management Sciences	Q2	Trade impact
10.	Factory Southern Africa? SACU in Global Value Chains (Farole, 2016)	World Bank Group Research Observer Report No. 102850	Q1	Infrastructure challenges
11.	Export-led growth hypothesis: Empirical evidence from the Southern African Customs Union countries. (Malefane, 2021)	Entrepreneurial Business and Economics Review	Q1	Infrastructure challenges
12.	Towards promoting African participation in global value chains: Does infrastructure development matter? (Ketu, & Wirajing, 2024)	Research in Globalization	Q1	Infrastructure challenges
13.	The Capabilities Driving Participation in Global Value Chains (Pathikonda & Farole, 2016)	World Bank Group Research Observer Policy Research Working Paper No. 7804	Q1	Policy implications
14.	Trade Facilitation for Global and Regional Value Chains in SACU (Harmon, 2015)	World Bank Group Research Observer Working Paper	Q1	Sustainability
15.	Championing a Regional Spatial Data Infrastructure: Southern African Customs Union Case (Maphale, 2023)	African Journal on Land Policy and Geospatial Sciences	N/A	Infrastructure challenges

16.	Balancing Power and Consensus: Opportunities and Challenges for Increased African Integration (Byiers & Miyandazi, 2021)	Istituto Affari Internazionali	N/A	Infrastructure challenges
17.	Competition, regional integration and inclusive growth in Africa: A research agenda (Roberts et al., 2017)	Klaaren, J., Roberts, S. & Valodia, I. (eds). Competition Law and Economic Regulation in Southern Africa	N/A	Infrastructure challenges
18.	Industrial policy in Southern African regional integration and development (McCarthy, 2014)	Stellenbosch: Tralac, Working Paper No. S14WP02/2014	N/A	Infrastructure challenges
19.	The potential for internal trade and regional integration in Africa (Geda & Seid, 2015)	Journal of African Trade	N/A	Infrastructure challenges
20.	Rail and ports: Challenges and solutions for South Africa's freight system (Department of Transport, 2023b)	Annual Report for 2022/23 Financial Year Vote 40: Department of Transport	N/A	Infrastructure challenges
21.	Annual state of cross-border operations Report (C-BRTA, 2022)	C-BRTA Annual Report	N/A	Infrastructure challenges
22.	Southern African Customs Union (SACU) Integrated Annual Report 2024 (SACU, 2024)	SACU Secretariat	N/A	Infrastructure challenges
23.	Regional Trade Integration and Regional Value Chains in Africa: Implications for the Africa Continental Free Trade Area Agreement (Nare & Alhassan, 2024)	Afreximbank Policy Research Working Paper Series No. APRWPS/2024/03	N/A	Infrastructure challenges
24.	The road maintenance backlog in South Africa (Ross & Townshend, 2018)	CSIR International Convention Centre	N/A	Infrastructure challenges
25.	Linking Southern Africa into South Africa's global value chains (Banga & Balchin, 2019)	WIDER Working Paper 2019/62	N/A	Policy implications
26.	The South Africa – UK International Economic Partnership (IEP): Trade Policy Research Priorities for South Africa (Edwards et al. 2024)	Pretoria: Programme implemented by DNA Economics.	N/A	Sustainability
27.	A Monitoring and Evaluation Sustainability Framework for Road Freight Transporters in South Africa (Lalendle et al., 2021)	Sustainability	N/A	Infrastructure challenges and sustainability
28.	Southern African Customs Union (SACU). (Ndzama, 2025)	The economics of Regional Integration	N/A	Infrastructure challenges, trade impact and policy implications

Table 10: Scopus Journal Ranking and Journal/Source Classification

In this study, we give more weight to articles published in **top-ranked journals** (Scopus Q1 and Q2) because these are generally regarded as the best in their respective fields. They undergo strict review processes, which means the research is typically of high quality, original and influential. Articles in these journals are also widely read and cited, which helps shape future studies. Using journal quartiles as a guide adds transparency to how we choose and prioritise sources, since these rankings are based on clear, objective measures.

That said, relying **solely on top journals can possibly provide a narrow perspective**. Some essential and practical insights can be found in various sources, including government reports, policy documents, industry white papers, conference papers and books. For example, reports from the Department of Transport or the Council for Scientific and Industrial Research may provide real-world evidence about infrastructure challenges that top journals might not cover. Regional journals and newer publications can also contain valuable work that is directly relevant to SACU trade but may not be ranked in Scopus. Ignoring these would risk **publication bias**, where critical perspectives are left out simply because of where they were published.

To avoid this, our approach was guided by **reputability** rather than ranking alone. This means still prioritising top journals but also including other sources when they meet key standards: (1) the source comes from a recognised authority or credible institution, (2) the methods and data are clearly explained, (3) the content is directly relevant to the topic, and (4) the work is widely cited or used in policy and practice. In this way, the review stays academically rigorous while also being comprehensive and practical.

Table 11: Going Beyond quartiles, authoritative literature

No.	Article	Journal	Authoritative Source	Citations of Article or Policy use
1.	Championing a Regional Spatial Data Infrastructure: Southern African Customs Union Case (Maphale, 2023)	African Journal on Land Policy and Geospatial Sciences	Indexed by DOAJ	3
2.	Balancing power and consensus: opportunities and challenges for increased African integration (Byiers & Miyandazi, 2021)	Istituto Affari Internazionali	Global go to think tank Index	5
3.	Competition, regional integration and inclusive growth in Africa: A research agenda (Roberts et al., 2017)	Klaaren, J., Roberts, S. & Valodia, I. (eds). Competition Law and Economic Regulation in Southern Africa	Johannesburg: Wits University Press	19
4.	Industrial policy in Southern African regional integration and development (McCarthy, 2014)	Stellenbosch: TRALAC, Working Paper No. S14WP02/2014	Stellenbosch University. The Trade Law Centre	9
5.	The potential for internal trade and regional integration in Africa (Geda & Seid, 2015)	Journal of African Trade	African Export–Import Bank	129
6.	Rail and Ports: Challenges and Solutions for South Africa’s Freight System (Department of Transport, 2023b)	Annual Report for 2022/23 Financial Year Vote 40: Department of Transport	Department of Transport South Africa	South African Transport Policy
7.	Annual State of Cross-Border Operations Report (C-BRTA, 2022)	C-BRTA Annual Report	Cross-Border Road Transport Agency Act, 1998 (Act No. 4 of 1998)	South African Transport Policy
8.	Southern African Customs Union (SACU) Integrated Annual Report 2024 (SACU Secretariat, 2024)	SACU Secretariat	Southern African Customs Union	Regional Policy
9.	Regional trade integration and regional value chains in Africa: Implications for the Africa Continental Free Trade Area Agreement (Nare & Alhassan, 2024)	Afreximbank Policy Research Working Paper Series No. APRWPS/2024/03	African Export–Import Bank	2
10.	The road maintenance backlog in South Africa (Ross & Townshend, 2018)	CSIR International Convention Centre	The Council for Scientific and Industrial Research: Established by an Act of the South African parliament in 1945	10
11.	South Africa’s economic progress: challenges and opportunities for sustainable development (Enaifoghe et al., 2021),	International Journal of Development and Sustainability	Indexed by DOAJ	3

12.	Linking Southern Africa into South Africa's global value chains (Banga & Balchin, 2019)	WIDER Working Paper 2019/62	United Nations University World Institute for Development Economics Research	9
13.	The South Africa – UK International Economic Partnership (IEP): Trade Policy Research Priorities for South Africa (Edwards et al., 2024)	Pretoria: Programme implemented by DNA Economics.	Economic Research Southern Africa (ERSA)	Trade, Industrial and Competition Policy
14.	Southern African Customs Union (SACU) (Ndzama, 2025)	The Economics of Regional Integration	Routledge	1
15.	A Monitoring and Evaluation Sustainability Framework for Road Freight Transporters in South Africa (Lalendle et al., 2021)	Sustainability	Multidisciplinary Digital Publishing Institute (MDPI)	20

Table 11: Establishing Reputability.

The inclusion of grey literature and institutional reports in a systematic review is a direct application of the methodology championed by Tranfield *et al.* (2003: 209-215). They argue that a comprehensive, unbiased search is a fundamental principle of systematic review, specifically designed to counteract researcher bias and a lack of thoroughness inherent in traditional narrative reviews

A core tenet of their approach is that the search strategy must extend beyond published journals to include "unpublished studies, conference proceedings, industry trials, the Internet and even personal requests to known investigators" (Tranfield *et al.*, 2003: 215 -216). This is crucial because, as they note, in management research raw data are often not available in academic articles, which typically represent partial studies. Relying solely on published journals can therefore lead to an incomplete and potentially biased understanding.

Table 11 presents a curated selection of grey literature and institutional reports relevant to the research topic. Including these sources is a deliberate and methodologically sound practice, directly aligned with the principles of systematic review as championed by Tranfield *et al* (2003) as discussed above.

Grey literature, which includes reports from governments, NGOs, think tanks and research institutions, provides a crucial corrective to this bias. It offers access to current policy and practice, providing real-world data, operational challenges and strategic directives that may not yet be reflected in academic publications. This literature also provides detailed case studies and evaluations grounded in specific institutional and regional contexts. By incorporating these documents, we move beyond the "partial studies" often found in journals and towards a more comprehensive, transparent, and balanced synthesis of available knowledge.

The table uses an approach guided by reputability rather than ranking alone. It includes other sources when they meet key standards: (1) the source comes from a recognised authority or credible institution, (2) the methods and data are clearly explained, (3) the content is directly relevant to the topic, and (4) the work is widely cited or used in policy and practice. In this way, the review stays academically rigorous while also being comprehensive and practical.

Therefore, Table 11 is a foundational element of a rigorous, evidence-informed approach. It ensures that our review captures the full spectrum of knowledge, from theoretical academic contributions to the practical insights and raw data found in policy documents and institutional reports, thereby enhancing the validity and utility of the subsequent analysis.

In summary, this two-pronged approach provides for both rigour and comprehensiveness. On the one hand, Scopus Q1 and Q2 articles provide the core of high impact, rigorously vetted academic knowledge and should be weighted more heavily in synthesising the dominant academic discourse and strongest evidence. However, intentionally seeking and incorporating reputable non-quartile sources is essential for comprehensiveness, capturing practical/policy insights, including conference work, mitigating bias and ensuring that the review reflects the full spectrum of relevant knowledge. Weighing non-quartile sources is applied based on their assessed quality, relevance and authority when using predefined criteria.

Interpretation of the findings

The last step of the SLR process involves the interpretation of the literature findings. This will be covered in chapter 4.

Chapter 3: Conclusion

This chapter has outlined the research design and methodology of the study, with a focus on the application of a systematic literature review.

By combining a rigorous screening and quality assessment process with a balanced weighting of both high-impact academic sources and reputable non-quartile contributions, the methodology ensures a comprehensive evidence base.

The structured approach guarantees transparency and replicability while mitigating the risks of bias and incompleteness. The outcome is intended to be a synthesis that not only maps the infrastructure barriers affecting intra-SACU trade but also highlights evidence-based strategies for promoting sustainable regional integration.

Chapter 4: Findings and discussion

4.1 Introduction

This chapter presents the findings from the systematic literature review (SLR) undertaken for this study and outlined in Chapter 3. As mentioned, the review spans academic articles, government reports and institutional publications, all of which offer insights into the infrastructure bottlenecks and policy frameworks impacting trade flows and economic integration in SACU.

The systematic review revealed several key themes shaping intra-SACU trade. The most significant challenges identified include infrastructure deficits, trade barriers and sustainability-related concerns. In addition, the literature highlights policy interventions as crucial for addressing these obstacles and supporting more effective and sustainable regional integration. These challenges are also interconnected or crosscutting. Taken together, they shape the structural constraints that undermine SACU's capacity to achieve resilient, competitive and inclusive trade integration.

This chapter concludes by providing an implementation roadmap to make intra-SACU trade more sustainable. These policy actions are informed by the findings of the systematic literature review (SLR) and constitute a coherent, multi-stage strategy aimed at strengthening and sustaining regional trade. The roadmap's effectiveness is contingent upon directly addressing these challenges. The implementation roadmap's timeline is divided into three phases: immediate actions, medium-term actions, and long-term actions. Immediate actions, spanning one to two years, focus on addressing the critical challenges facing intra-SACU trade. Medium-term actions, over three to five years, aim to deepen regional integration and tackle structural constraints to achieve sustainable intra-SACU trade. Long-term actions, extending beyond five years, are directed towards realising a sustainable and fully integrated regional economy.

The chapter shows that trade extends beyond merely increasing trade volumes; it encompasses the development of a resilient, efficient and equitable regional economic system. When implemented in alignment with the identified challenges, this roadmap provides a practical and evidence-based pathway toward achieving these objectives.

The following section will provide a summary of the SLR findings.

4.2 Summary of SLR findings

The systematic review revealed several key themes shaping intra-SACU trade. The most significant challenges identified include infrastructure deficits, trade barriers and sustainability-related concerns. In addition, the literature highlights policy interventions as crucial for addressing these obstacles and supporting more effective and sustainable regional integration. Section 4.2 therefore provides a summary of these SLR findings and related policy recommendations, while Section 4.3 offers a more detailed discussion and analysis.

4.2.1 Infrastructure challenges in SACU

Infrastructure challenges emerged as a key barrier to intra-SACU trade, highlighted with resounding clarity across the analysed SLR literature. The results identify a region-wide deficit in both physical and digital systems, encompassing poorly maintained road and rail networks, inefficient border posts and unreliable energy supplies (SACU, 2024:39 & 53; Department of Transport, 2023b:34).

These infrastructure deficiencies directly translate into increased logistical costs, extended transit times and heightened vulnerability to external shocks, severely diminishing the competitiveness of goods traded within the union (Malefane, 2021:65-66). Consequently, the potential for deeper regional economic integration and the development of robust regional value chains is significantly undermined, because the efficient cross-border movement of goods is impaired.

This union-wide infrastructure challenge has emerged as a critical point of discussion because it represents the foundation upon which all other ambitions for sustainable trade depend. Malefane (2021:66) and SACU's Institutional Report move beyond merely cataloguing these impediments to highlight their profound secondary effects: they perpetuate economic inequity between Member States, reduce competitiveness and increase costs across the SACU region.

4.2.2 Non-tariff barrier (NTB) challenges in SACU

Based on the reviewed literature, Non-Tariff Barriers (NTBs) also emerged as critical impediments to trade, fundamentally undermining the efficiency gains expected from tariff liberalisation within SACU. The literature consistently identifies a range of such barriers, including cumbersome and unpredictable border clearance processes, lack of harmonisation in sanitary and phytosanitary standards, restrictive transport regulations (e.g., cabotage rules) and inefficient VAT refund mechanisms (Ndzama, 2025:279; C-BRTA, 2022:2 & 150; Harmon, 2015:14 & 23).

These NTBs are not mere inconveniences. As Safaeimanesh and Jenkins (2021:9-11) quantitatively demonstrate, the compliance costs associated with these cumbersome procedures act as an additional tax on trade, creating significant economic inefficiencies and deadweight losses that far exceed the costs imposed by tariffs themselves.

The importance of NTBs in the literature stems from their profound impact on trade competitiveness and sustainability, especially as the union has progressively removed traditional tariff barriers (Safaeimanesh & Jenkins, 2021). Reports from institutions like the Cross-Border Road Transport Agency (C-BRTA, 2022) and the South African Department of Transport (2023b) highlight how NTBs are compounded by physical infrastructure challenges such as port congestion, rail failures and poor road conditions. These factors act as multipliers for NTBs, with inefficiencies in one area worsening delays and costs created by administrative barriers in another—creating a vicious cycle that stifles trade.

Understanding the specific nature and intensified impact of NTBs, as well as their interaction with infrastructure deficits, is therefore essential for effective policy formulation. The following sections delve deeper into this impact, examining sector-specific effects and the potential for sustainable regional value chains within SACU.

4.2.3 Sustainability challenges in the SACU

The reviewed studies also highlight the long-term sustainability of intra-SACU trade, underscoring the need for sustainable infrastructure development and the integration of environmental considerations into planning. The lack of environmentally friendly

transport solutions and the heavy dependence on road freight were noted as critical factors that could undermine the future sustainability of intra-regional trade.

Therefore, sustainability is no longer a side concern but a central issue, framing the future of intra-SACU trade as contingent on strategic investments in resilient infrastructure, harmonised policies and greener logistics. Only through these measures can SACU build a more efficient, equitable and environmentally sound regional trading system.

4.2.4 Policy interventions/implications

Various policy initiatives aimed at improving infrastructure and addressing trade barriers were explored in the literature. The Southern African Development Community (SADC), the implementation of one-stop-border posts (OSBPs) and efforts to harmonise transport regulations within the Southern African Development Community (SADC) were noted as positive steps towards improving intra-regional trade. However, the literature also emphasised the need for more robust, region-wide policy coordination to close infrastructure gaps and reduce inefficiencies. This need is also directly addressed by contemporary regional and national rail-focused policies, which target the systemic infrastructure deficits identified across sources.

The review also showed that the four main themes—infrastructure challenges, trade barriers, sustainability and policy interventions—are deeply interconnected. For example, Vilakazi (2018: 394–401) notes that poor roads and border inefficiencies contribute to high trade costs across Southern Africa. Similarly, the SACU Secretariat report (2024:65–105) identifies gaps in physical and digital infrastructure as significant trade barriers. Both sources agree that inadequate infrastructure directly undermines trade efficiency. Current policy interventions explicitly aim to rectify this by shifting freight from road to rail, thereby alleviating the congestion and high costs documented in the literature. The Department of Transport (2023b) Freight Migration Plan detailed in South Africa’s Department of Transport Annual Report (2022/23) and the Integrated Corridor Approach of the Programme for Infrastructure Development in Africa (PIDA) (C-BRTA, 2022a) are direct responses to these identified challenges.

Despite differences in emphasis—policy in Vilakazi (2018) versus infrastructure in the SACU Secretariat (2024)—both sources converge on three key points, each of which is mirrored in recent policy frameworks:

- Infrastructure deficits and bureaucratic failures obstruct trade sustainability. This is tackled through interventions like developing rail infrastructure along regional corridors per the SADC Regional Infrastructure Development Master Plan (C-BRTA, 2022a) and creating a National Rail Master Plan (Department of Transport, 2023b) to guide investment. The call for Rail infrastructure readiness and corridor rehabilitation aligns directly with the need to close physical gaps.
- Border efficiency through OSBPs and digital systems is critical. Policy extends this to corridor performance, with C-BRTA (2022a:12) advocating for Corridor Performance Monitoring Systems (CPMS) to optimise inter-modal transfers and identify bottlenecks using data.
- Integrated solutions combining infrastructure investment with policy reform are essential. This is the core of the current policy approach. The National Rail Policy (white paper) and Railway Safety Bill (Department of Transport, 2023b) provide regulatory certainty, while regional regulatory harmonisation efforts align rail with agreements like the Tripartite TTTFP (C-BRTA, 2022a:50-54). Furthermore, public-private partnerships (PPPs) and the private sector participation (PSP) Framework are promoted to overcome funding shortages—a key systemic barrier highlighted in the literature review.

Among the 28 articles reviewed (see Table 10, Chapter 3), 17 articles explicitly identify infrastructure gaps as the primary reason for high trade costs and inefficiencies within SACU. Five additional articles illustrate the interdependencies between infrastructure, policy, and sustainability. The proposed rail interventions are designed to address these interdependencies. For instance:

- C-BRTA (2022a:30) highlights inadequate cross-border facilities in Johannesburg that hinder regional trade.
- Edwards *et al.* (2024:20) discuss South Africa's transport and energy crises and their ripple effects on landlocked SACU members.

- Ketu and Wirajing (2024:3) emphasise high transport costs restricting trade efficiency.
- Lalendle *et al.* (2021:3) notes that road freight dominance (91.2% of emissions) worsens congestion, increases pollution, and strains road maintenance.
- Safaeimanesh and Jenkins (2021:11) focus on reducing NTBs to maximise trade benefits for South Africa.

While infrastructure is central, policy interventions are critical solutions—such as modernising border posts (C-BRTA, 2022:132–152) or leveraging AfCFTA to offset infrastructure gaps (Edwards *et al.*, 2024:40). The consolidated rail policies embody this, using instruments like the High-Speed Rail Corridor Framework and Project Preparation Facilities (PPDF) to unlock investment and modernise infrastructure. Sustainability is also closely tied to resilient infrastructure. For example, Lalendle *et al.* (2021) in line with this paper highlight triple bottom line metrics (economic, social and environmental), while the other four studies frame sustainability as an outcome of addressing infrastructure gaps. The modal shift to rail, supported by the full suite of policies, advances all three sustainability pillars by aiming to lower logistics costs (economic), reduce emissions (environmental), and decrease road congestion and accidents (social).

Another important finding is that infrastructure gaps are systemic, not just physical. The challenges SACU faces extend beyond inadequate roads, ports, or energy facilities. They stem from deeper governance, regulatory, and institutional inefficiencies. The policy responses acknowledge this by combining structural reforms (National Rail Policy), safety regulation (Railway Safety Bill), and funding frameworks (PPPs) to address fragmented authority, poor coordination, and underfunding. Weighting sources by credibility (Scopus-ranked articles and institutional authority reports) provided a more nuanced understanding of how these challenges affect different SACU members. The dual focus of the policies—on both regional corridor development (addressing landlocked members' corridor inefficiencies) and national port-connecting rail projects (addressing coastal nations' capacity issues)—reflects this nuanced understanding. For instance, the World Bank (Farole, 2016) and Afreximbank (Nare 86 & Alhassan, 2024) show that coastal nations face port capacity

issues, while landlocked members suffer from border delays and corridor inefficiencies.

Overall, the evidence highlights the fact that sustaining intra-SACU trade requires integrated solutions which would include the following, each reflected in the consolidated policy interventions:

- Harmonising policies to reduce NTBs (for example via the TTTFP and national regulatory reforms).
- Targeting infrastructure investments to address spatial inequalities (via the SADC RIDMP, National Rail Master Plan, and corridor-specific rail development).
- Incorporating environmental safeguards into transport logistics (via Green Procurement Guidelines and explicit freight shift targets to lower emissions).

The combination of academic and institutional sources thus provides a strong foundation for evidence-based policy recommendations, tailored to the SACU's unique governance and geographical context. The analysed rail and modal shift policies represent a concrete, multi-level attempt to implement these very recommendations.

4.3 Comprehensive discussions of the main SLR findings

The following section provides a more comprehensive insight into the main SLR findings, structured around the key themes that emerged from the literature: infrastructure challenges, trade barriers, sustainability concerns and policy recommendations.

4.3.1 Infrastructure challenges

Infrastructure plays a pivotal role in shaping the dynamics of intra-SACU trade. Both transport infrastructure (roads, rail and ports) and digital and energy systems are integral to facilitating the smooth flow of goods across the region. Findings from the SLR literature show that SACU's infrastructure challenges manifest in three critical dimensions.

Transport infrastructure

Well-maintained roads, efficient border post management and reliable rail networks are essential for ensuring that goods move efficiently across the region. However, the SLR literature reveals that the quality and availability of transport infrastructure in SACU remain persistent challenges that directly undermine intra-SACU trade. While South Africa, as the largest trade partner within SACU, has a relatively well-developed road infrastructure along major corridors such as the N1 and N3 highways, many neighbouring countries face significant challenges. Rural and provincial roads often lack sufficient maintenance, particularly in Botswana, Lesotho and Eswatini, which hampers the ability to move goods quickly and cost-effectively, thereby reducing trade potential.

The growing reliance on road freight, primarily due to the inadequate rail infrastructure, exacerbates this issue further. Heavy goods vehicles (HGVs) dominate key trade routes such as the N3 corridor between Durban and Johannesburg, contributing to traffic congestion, road deterioration and rising transportation costs (Vilakazi, 2018).

Looking ahead, the most pressing challenge is South Africa's road maintenance backlog, estimated to be approximately R75 billion to R200 billion (Tetley *et al.*, 2022:147; Department of Transport, 2023b:35 & 88). If South Africa struggles to maintain its existing road infrastructure due to financial constraints, the likelihood of expanding or improving the network in future is minimal. Additionally, while South Africa plans to shift 10% of road freight to rail (Department of Transport, 2023b:13), the country's railway system is already unable to handle current volumes, making the effectiveness of this strategy highly questionable.

Furthermore, port bottlenecks and inefficiencies at border posts, such as lengthy customs procedures, add to delays and disrupt supply chains.

Port bottlenecks and border inefficiencies

The SLR literature highlights that port bottlenecks and border inefficiencies significantly disrupt supply chains, particularly for SACU's landlocked members (e.g., Botswana and Eswatini) that rely heavily on South African ports. In South Africa, inefficiencies in container freight rail and port services increase the cost of imports and undermine the competitiveness of exports (Department of Transport, 2023b:23). As noted earlier, HGVs dominate trade corridors, which accelerates road degradation, raises logistics costs and weakens regional supply chains.

Northbound border delays—worsened by port inefficiencies—further inflate costs, as most SACU/SADC member states import more goods from South Africa than South Africa imports from them. This results in more traffic moving northbound and creating longer delays at fixed transit points, especially during peak trading periods (C-BRTA, 2022:119-130). Conversely, many southbound HGVs travel with empty loads, adding to the inefficiencies (Vilakazi, 2018).

Border inefficiencies are further compounded by institutional and regulatory fragmentation, such as discrepancies in vehicle compliance standards and fraudulent licensing (Lalendle *et al.*, 2021:16). Another layer of complexity arises from the fragmented governance of roads: national roads (3%), provincial roads (29.7%), metropolitan and district municipal roads (49%), and other roads (18%) fall under different authorities (Ross & Townshend, 2018:2). Such disjointed management leads to poor coordination and delays at border crossings—for example, on roads linking South Africa to Lesotho or Eswatini.

Energy and communication infrastructure

Energy and communication infrastructure also play a critical role in shaping trade efficiency. Unreliable electricity supply disrupts production processes, while weak communication systems limit the coordination of trade activities and undermine the efficiency of logistics.

One of the most pressing concerns is the lack of interoperable digital systems across SACU member states, which constrains automation and data exchange. While SACU aims to achieve “*interoperability and interconnectivity*” of digital solutions at both the national and regional levels (SACU, 2024: 89), implementation has been slow. Uneven access to internet connectivity and digital skills further deepens disparities, limiting the adoption of e-commerce and digital trade solutions (SACU, 2024: 104). Resource gaps, such as inadequate funding for infrastructure projects (e.g., road rehabilitation and digital systems), are explicitly cited as barriers to implementing much-needed trade facilitation initiatives (SACU, 2024: 43 & 77).

Energy infrastructure gaps further compound these challenges. Erratic power supply at strategic border posts often slows down electronic customs clearance. Although

⁴Northbound trucks = trucks moving from South Africa to other African countries (like Botswana, Namibia, Zambia). Northbound delays = the hold-ups these trucks face at border posts when leaving South Africa

some border posts have backup generators, these are frequently undersized or poorly maintained, which undermines efficiency and causes delays (C-BRTA, 2022:34). Power outages also disrupt cold-chain logistics for perishable goods and affect digital systems for pre-clearance. A notable example is the Electronic National Traffic Information System (eNaTIS), which frequently experiences breakdowns, resulting in delays in the issuance of driver's licences and vehicle registrations, which are crucial for freight operators.

These digital and energy gaps represent a multifaceted challenge as they simultaneously disrupt production and logistics. Fragmented digital systems hinder automation, while unreliable electricity increases manufacturing costs (SACU, 2024: 89). Furthermore, trucks idling at border posts due to power-related delays significantly contribute to emissions, creating a sustainability concern alongside economic inefficiencies.

Findings from the SLR literature, therefore, suggest that sustained investments in energy and communication networks are critical to improving trade efficiency and ensuring that businesses across the SACU region have the tools required to participate effectively in cross-border trade.

4.3.2 Non-tariff barrier challenges

The SLR shows that SACU enjoys a standard external tariff and theoretically free internal trade. However, its potential for fostering sustainable economic integration and development is severely undermined by a complex web of non-tariff barriers (NTBs). These barriers inflate costs, create crippling uncertainty and fragment the regional market, preventing the emergence of robust regional value chains. Based on a synthesis of key reports, these NTBs can be categorised into specific or interconnected constraints: firstly, technical barriers and sanitary and phytosanitary measures; secondly, cumbersome customs and administrative procedures; and lastly, inconsistent standards and poor implementation. These barriers are subsequently explained.

Technical barriers to trade (TBT) and sanitary and phytosanitary (SPS) measures

This category represents some of the most direct and damaging NTBs, particularly for the agricultural and processed food sectors, which hold high potential for regional value chain (RVC) development. Farole (2016:59) illustrates this with the well-known “cheeseburger problem”: a single processed food product is subject to multiple, complex SPS forms because no single document accommodates its composite ingredients, making trade excessively complicated.

This lack of harmonisation is systemic. For example, different veterinary standards and inconsistent classification of foot-and-mouth disease (FMD) zones between Namibia, Botswana and South Africa have historically crippled the regional beef value chain (Farole, 2016:27–28). The SACU Secretariat acknowledges that while customs procedures are advancing, other border procedures—such as SPS and health checks—lag significantly behind, resulting in goods being impounded and shipments being missed (SACU, 2024:58).

As Wajda-Lichy (2014:148) explains, TBTs and SPS measures typically encompass internal regulations that can act as barriers to trade if not harmonised—particularly for SMEs, which are crucial for sustainable and inclusive growth. Supporting this, Oso and Adelakun (2025:1–8) identify standard compliance requirements as a significant constraint on both exports and imports, adding a costly hurdle to market entry, in addition to the already cumbersome customs and administrative procedures SMEs endure.

Cumbersome customs and administrative procedures

Border inefficiency remains a primary physical manifestation of NTBs, directly translating into time and money lost. The Annual State of Cross-Border Operations Report quantifies this impact: on some key corridors, customs processes alone can consume over 136 hours (77%) of a truck’s northbound journey, with standing time costing a single operator over R116,106.25 annually (C-BRTA, 2022: 81–90; Farole, 2016: 57).

The SACU Integrated Report confirms that paper-based and manual transactions dominate current practices, underscoring the need for a significant digital

transformation to achieve paperless trade (SACU, 2024:89–91). The private sector consistently raises concerns about onerous requirements and processes, a high cost of transacting, and a lack of predictability as fundamental constraints to doing business in the Union (SACU, 2024:65).

For time-sensitive sectors such as manufacturing and perishable goods, these delays are particularly damaging, as they disrupt just-in-time supply chains, force firms to hold costly inventory and render regional production models uncompetitive (Farole, 2016: 39–40). However, border inefficiency is only the surface-level symptom of broader regulatory and political challenges—namely the gap between agreement and implementation.

Inconsistent standards, regulations and poor implementation of agreements

Perhaps the most profound challenge faced by SACU is the gap between policy and practice. Despite regional commitments, domestic protectionist policies often override agreements. For example, import bans and quotas on goods such as grain and poultry are frequently used for infant industry protection, while Botswana's statutory beef export monopoly effectively eliminates competition (Farole, 2016: 28, 51).

A critical problem is the lack of political will to implement binding agreements. The streamlined SACU operational structure has faced repeated delays, stuck in a complex system of 18 committees (SACU, 2024:90). This governance deficit is intensified by low institutional quality. As Ketu and Wirajing (2024:12–14) argue, infrastructure only boosts trade if a minimum threshold of government effectiveness is met. Without effective governance, even the most technical solutions fail.

Poor governance leads to the inconsistent application of rules, the weak enforcement of SACU protocols and environments where corruption flourishes. This unpredictability is particularly harmful to SMEs, which cannot rely on uniform standards across Member States. Furthermore, a culture of non-confrontation allows NTBs to persist, as smaller firms fear reprisals if they challenge barriers, describing the situation as a “*hostage game*” (Farole, 2016:60).

Sustainability and the urgency of reform

The sustainability of intra-SACU trade is directly contingent on dismantling NTBs. Persistent technical barriers, border inefficiencies and governance weaknesses

undermine SACU's capacity to function as a truly integrated customs union. Unless addressed, these challenges raise doubts as to whether the SACU will remain a customs union in name only, unable to harness its collective potential for sustainable trade and resilient regional development.

4.3.3 Sustainability challenges

Findings from the SLR literature revealed that intra-SACU trade is not only challenged by infrastructure deficits and NTBs but also by broader sustainability concerns that have long-term implications for economic growth and regional integration. The SLR literature revealed certain key sustainability themes, including environmental sustainability, economic inequality and long-term infrastructure feasibility, with cross-cutting aspects. This will be explained below.

Environmental sustainability

One of the most pressing challenges to the sustainability of intra-SACU trade is its environmental impact. The heavy reliance on road freight is particularly problematic, as road transport accounts for a significant share of CO₂ emissions. The SLR literature highlights that transportation infrastructure in SACU has not yet integrated sustainable solutions such as green transport networks, electric vehicles or energy-efficient systems. Without adequately addressing environmental impacts, the long-term viability of trade flows could be undermined—especially as global attention on climate change continues to intensify.

Environmental sustainability emerges as a key theme primarily due to the dominance of road freight and the region's associated carbon exposure. A significant concern is the high incidence of empty truck returns, with southbound loads from member states accounting for 32–50% of freight volumes. This inefficiency not only raises costs but also doubles emissions through excessive idling at border posts and various transit points (Harmon, 2015:25–26). At the same time, rail remains under-utilised due to persistent capacity constraints and the high costs associated with handling smaller freight volumes (Harmon, 2015:5–6). Currently, the existing railway network does connect South Africa to three SACU partners—Botswana, Eswatini, and Namibia—but Lesotho remains the only member without a rail link, leaving it fully reliant on road freight. This gap worsens regional congestion and emissions. A sustainable path for Lesotho should include exploring a new rail connection or upgraded intermodal

terminals, paired with soft reforms like load-pooling incentives and integration into regional smart corridors with the aim to reduce empty truck trips, lower emissions, and align with the broader push for greener, more efficient intra-SACU trade.

Lalendle *et al.* (2021:2) further note that road freight generates 90% more greenhouse gas emissions than rail in South Africa. This challenge is compounded by South Africa's carbon-intensive energy system, which relies on coal for more than 85% of its electricity production (Edwards *et al.*, 2024:58–65). As a result, logistics and manufacturing are not only more emission-intensive but also less competitive in global markets.

In summary, SACU's heavy dependence on road freight, combined with an energy system reliant on coal, poses a significant environmental and competitiveness threat to the sustainability of intra-SACU trade.

Economic inequality

The uneven distribution of infrastructure development within SACU member states presents another significant challenge. While countries such as South Africa and Namibia possess relatively well-developed transport and logistics infrastructure, landlocked nations like Lesotho struggle with inadequate roads and border facilities. This imbalance limits the ability of businesses in under-developed regions to access larger markets within the SACU, perpetuating economic inequality and hindering the region's overall economic development. The disparity between well-developed and underdeveloped infrastructure systems further complicates efforts to achieve regional integration and trade sustainability.

This structural inequality in infrastructure directly translates into economic disparities within the bloc. South Africa accounts for 97% of intra-SACU trade. In comparison, the remaining member states collectively contribute only 3% (Harmon, 2015:3). South Africa also represents the largest share of the SACU's GDP, whereas BLNE (Botswana, Lesotho, Namibia, and Eswatini) firms continue to lack global competitiveness (Edwards *et al.*, 2024:20). Infrastructure disparities thus entrench a core-periphery divide, whereby South Africa's advanced logistics infrastructure enables its dominance. At the same time, BLNE small and medium enterprises (SMEs) remain excluded from high-value trade chains.

Long-term feasibility of infrastructure systems

Another concern is the long-term feasibility of SACU's infrastructure systems. With a growing population and increasing trade volumes, there is a real risk that existing infrastructure will be unable to keep pace with demand. The lack of adequate maintenance funding, coupled with ageing infrastructure across many SACU countries, threatens the sustainability of intra-regional trade. Studies further highlight a lack of long-term strategic planning for infrastructure development, with some countries focusing on short-term fixes rather than sustainable, future-oriented solutions. Feasibility and efficiency being critically undermined by a web of institutional and regulatory barriers, with national customs procedures forming a significant non-tariff barrier that stifles regional freight integration. A clear example is the *Third Country Rule*, which prevents a transporter from country A, after delivering goods to country B, from carrying goods onward to country C.

This is exemplified by the practical enforcement of customs policies, such as South Africa's point-to-point model for bonded transit. The policy explicitly states that bonded goods "remain under Customs control until they have left South Africa or are duly entered on a goods declaration" and that export-cleared goods may not be returned without permission (SARS, 2025:6-47). This creates an operational barrier: a truck from Botswana carrying bonded goods to Namibia via South Africa cannot, after delivery, simply pick up a South African load for the return leg to Botswana. The new load would require a separate, complex export declaration, a process for which the transporter lacks authorisation. Consequently, the most efficient commercial outcome trip-chaining or backhaul loading is prohibited, forcing transporters to deadhead. This directly leads to the high rates of empty return trips, fleet under-utilisation, and inflated logistics costs extensively documented in the literature (Harmon, 2015:26; C-BRTA, 2022a).

This regulatory inefficiency exacerbates systemic pressures on SACU's aging infrastructure. By prohibiting efficient vehicle use, it adds unnecessary traffic volume, worsening congestion at key border posts and accelerating the deterioration of road networks, a large portion of which have already exceeded their design lifespan under growing HGV traffic. These infrastructural strains are compounded by profound institutional weaknesses within member states, exemplified by the dysfunction of

critical state-owned enterprises like Transnet and Eskom. Energy insecurity, in particular, has become a severe regional disruptor; load-shedding in South Africa alone reduced 2023 GDP growth by an estimated two percentage points, creating ripple effects throughout integrated supply chains (Edwards *et al.*, 2024:54). Ultimately, the interplay between restrictive customs regulations, institutional decay, and crumbling infrastructure creates a systemic risk of collapse for SACU-wide trade. Without harmonising policies to allow efficient cross-border freight movement and addressing parallel crises in infrastructure investment and institutional governance, the sustainability of the customs union is threatened, leaving its members structurally disadvantaged and their logistics operators excluded from high-value trade chains.

4.3.4 Policy implications for intra-SACU trade

The SLR literature shows that the SACU is fundamentally constrained by a triad of deeply entrenched policy challenges. The SLR literature reveals that there is none accidental stagnation. Still, it is a direct result of self-reinforcing policy aspects, including a disincentivising revenue-sharing formula, pervasive non-tariff barriers (discussed above), and critically inadequate trade facilitation infrastructure.

The SACU revenue sharing formula (RSF): A macro-policy disincentive

The most distinctive policy impediment within SACU is the revenue sharing formula (RSF). Initially designed to compensate smaller members for the loss of tariff-setting autonomy, the RSF has since evolved into a mechanism that creates uncooperative incentives and stifles industrial development, thereby undermining the sustainability of intra-regional trade. The formula entrenches fiscal dependency, as the national budgets of BLNE countries (Botswana, Lesotho, Namibia and Eswatini) rely heavily on South Africa's external trade policy rather than their own productive, trade-oriented capacity (Ndzama, 2025:270, 280–281). As Abban (2020:759) observes, the RSF distributes revenue based on intra-SACU imports—a structure that is both volatile and a significant impediment to trade within the SACU.

The SACU Revenue Sharing Formula, established by the 2002 Agreement, allocates the union's collective customs and excise duties through a three-component structure. First, the Customs Component is distributed based on each member's share of intra-SACU imports (using FOB values as a proxy). Second, the Excise Component is allocated according to each country's share of the total SACU GDP. Finally, a

Development Component, equivalent to 15% of the Excise pool, is added. This structure ensures that the smaller, net-importing economies—Botswana, Eswatini, Lesotho, and Namibia—receive a proportionately higher share of the revenue to support their fiscal stability and development, while South Africa, as the dominant economy and net exporter, contributes more to the pool than it receives back.

The critical sustainability challenge is that the RSF diminishes the urgency for BLNE governments to pursue industrial policy reforms and make the complex investments in economic diversification. With a significant portion of revenue guaranteed through the common revenue pool, BLNE states face little incentive to develop competitive manufacturing sectors capable of exporting to South Africa. This creates a perverse policy outcome, where guaranteed fiscal transfers discourage productive investment.

As Banga and Balchin (2019:4) demonstrate in their regional value chain analysis, this arrangement results in a considerable asymmetry in size and productive capacity. BLNE countries consistently lack the supply capacity to meet South African demand, even in sectors where they hold a comparative advantage (Banga & Balchin, 2019:6, 15 & 19). Thus, the RSF effectively locks the union into an unsustainable model of fiscal dependency, rather than propelling it toward a model of productive integration and industrial upgrading.

Inadequate trade facilitation and physical infrastructure: The logistical bottleneck

Policy failures in planning, investment and coordination are most starkly reflected in the inadequate state of trade facilitation and physical infrastructure across SACU. These challenges directly raise the cost and time of moving goods. The World Bank's Logistics Performance Index (see Chapter 2, Table 4) is frequently cited to demonstrate that, except for South Africa and Botswana, most Southern African countries perform poorly on logistics (Banga & Balchin, 2019:6).

The policy implications are severe. Poorly maintained roads, inefficient ports and unreliable rail networks significantly increase logistics costs (Ndzama, 2025). The absence of one-stop border posts (OSBPs) forces transporters to undergo duplicated clearance procedures, resulting in long and unpredictable delays (SACU, 2024; C-BRTA, 2022a). These deficits are further exacerbated by failures in related sectors, particularly the energy sector. As Ndzama (2025:279) notes, Eswatini relies on South

Africa for 80% of its energy needs. When South Africa experiences rolling power cuts, Eswatini's economic activity is immediately disrupted—illustrating how infrastructure failures in one member state directly undermine the productive capacity and financial security of another. For time-sensitive value chains, such inefficiencies are particularly damaging, as they erode comparative advantages and render intra-SACU trade fundamentally uncompetitive and unsustainable.

The literature consistently demonstrates that these policy failures are not isolated, but somewhat interconnected and mutually reinforcing. The fiscal dependency created by the RSF (Aspect 1) discourages the very industrial development required to overcome supply-side constraints. This entrenched economic asymmetry fosters protectionist instincts and a reluctance to harmonise regulations, thereby perpetuating non-tariff barriers (Aspect 2). At the same time, the lack of political cohesion and coordinated investment prevents the creation of the seamless logistical infrastructure (Aspect 3) that is essential for efficient and competitive intra-regional trade.

4.4 Crosscutting linkages

As mentioned in the previous section, intra-SACU trade faces three predominant challenges: the long-term challenges surrounding the feasibility of infrastructure systems, trade barriers and sustainability. These challenges are also interconnected or crosscutting in nature. Taken together, they shape the structural constraints that undermine SACU's capacity to achieve resilient, competitive, and inclusive trade integration. This will be explained.

Figure 4: The vicious cycle of road freight dependency, emissions and competitiveness in SACU

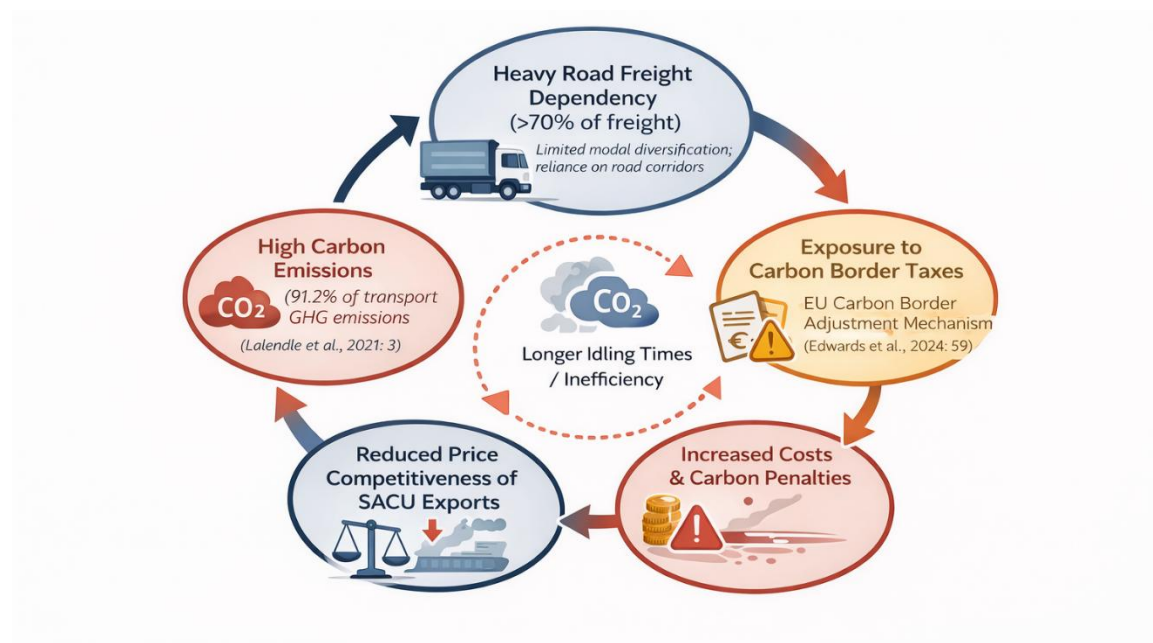


Figure 4: Environmental sustainability Sources: Author's own information from Harmon, 2015; Lalendle et al, 2021 & Edwards et al., 2024)

Figure 4: Environmental sustainability illustrates a negative feedback circle triggered by the region's heavy reliance on road freight, which accounts for over 70% of the freight payload in South Africa (Lalendle et al, 2021: 4). This high road freight dependency is the primary driver of high carbon emissions, with the road transport subsector responsible for a staggering 91.2% of the transport sector's greenhouse gas emissions (Lalendle et al., 2021:3). Additionally, this same dependency increasingly exposes the region to potential carbon taxes and penalties in its major export markets. These added costs directly reduce the price competitiveness of SACU, becoming entrenched in a vicious cycle of high costs, entrenched inequality and declining competitiveness, which in turn cause trucks to idle for longer, consuming more fuel, and worsening emissions. This makes SACU members, particularly South Africa, highly vulnerable to international carbon penalties. South Africa is ranked as the 14th most exposed country globally to the European Union's Carbon Border Adjustment Mechanism (CBAM) (Edwards et al., 2024: 59), posing a direct financial threat to its carbon-intensive exports such as iron and steel. These carbon tax penalties (a cost mentioned as an input by Lalendle et al. (2021:7) in Table 2 erode the price

competitiveness of regional exports, as higher operational costs and environmental tariffs make their goods more expensive and less attractive on the global market. Ultimately, it reduces trade competitiveness on the worldwide stage and threatens the revenue streams of the entire customs union.

Figure 5: The structural cycle of trade imbalance and economic inequality in SACU

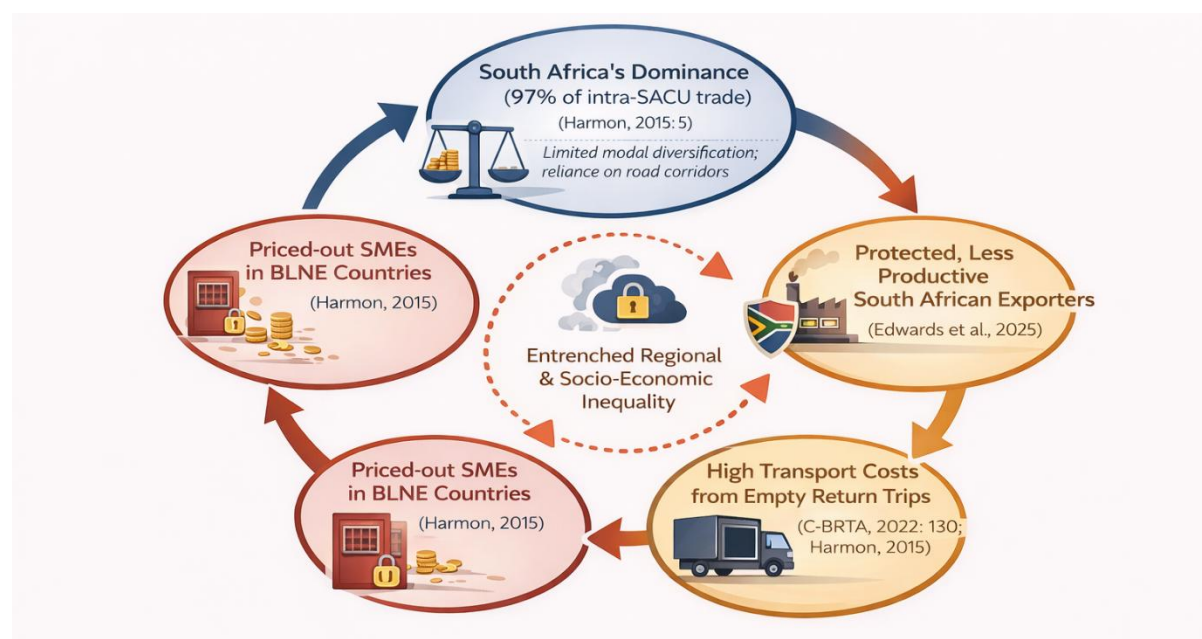


Figure 5: Economic inequality Sources: Author's own information from C-BRTA, 2022a; Harmon, 2015 and Edwards et al., 2024.

Figure 5: Economic inequality illustrates how the structure of trade perpetuates significant economic disparities. The data confirms that South Africa accounts for 97% of all intra-SACU trade (Harmon, 2015:5), creating a significant imbalance. This is not just a social issue but a core economic constraint. Edwards *et al.* (2025: 20) find that South African manufacturing firms exporting within SACU are far less productive than firms exporting outside of the region, protected by high preferential margins. This dynamic inhibits competition and reinforces South Africa's economic dominance, leading to asymmetric benefits and a concentration of financial activities. A tangible consequence of this imbalance is the critically high transport costs for BLNE countries. Transporters leaving South Africa with full trucks must often return empty (C-BRTA, 2022: 130; Harmon, 2015: 7, 25-27). The cost of this inefficiency is factored into northbound transport prices, creating a significant barrier for smaller businesses and emerging exporters in BLNE countries, thereby locking in socio-economic inequality (Harmon, 2015: 18-21).

Figure 6: The systemic cycle of infrastructure overstrains and logistics failure in SACU

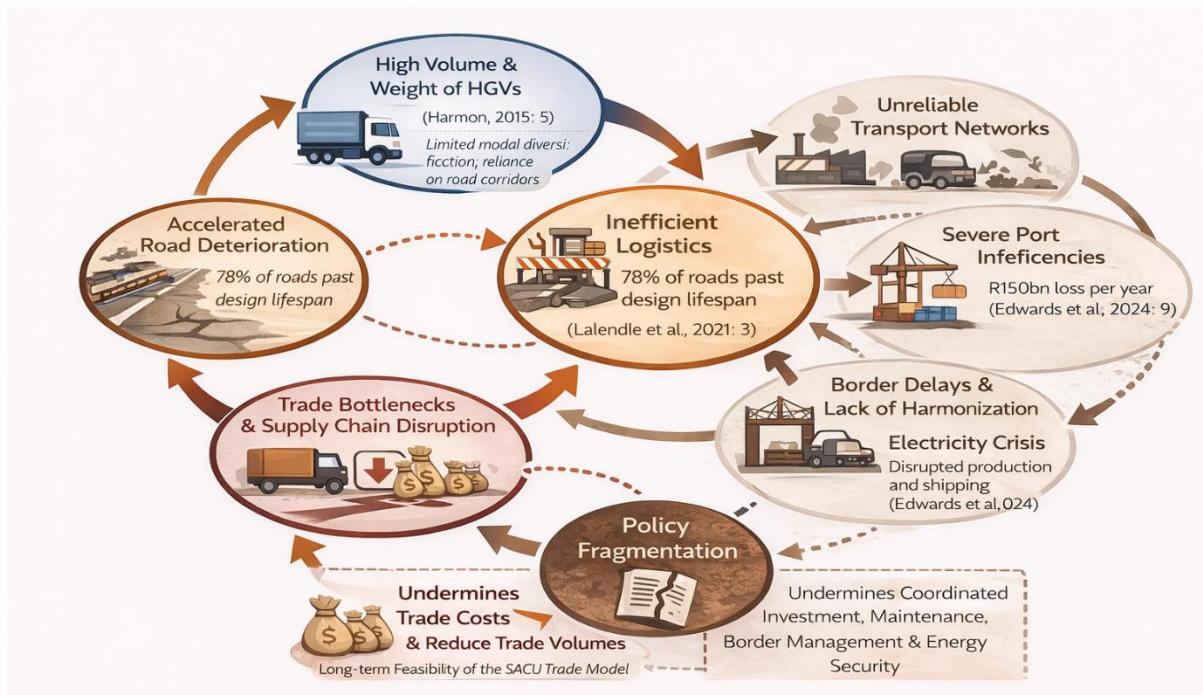


Figure 6: Infrastructure collapse Source: Author's own information from Harmon, 2015; Lalendle et al, 2021 and Edwards et al., 2024.

Figure 6: The long-term feasibility of infrastructure systems reveals the unsustainable pressures and operational failures that threaten the entire trade network. The cycle begins with the high volume and weight of HGVs on key routes, which accelerates road deterioration. This is a severe problem, with 78% of South Africa's national road network thought to have exceeded its intended design lifespan (Lalendle et al., 2021: 3). This creates a massive maintenance and upgrade backlog (Lalendle et al., 2021: 3), which, if unaddressed, results in unreliable transport networks. Edwards et al. (2024:9) offer stark evidence for this, stating that South African ports are among the worst-performing globally, with inefficiencies costing an estimated R150 billion in lost exports in 2022 alone. Operationally, a lack of harmonisation and predictability in border procedures creates delays that disrupt modern supply chains (Harmon, 2015: 24-25). When combined with the ongoing electricity crisis, which has reduced exporters' ability to produce and ship goods (Edwards et al., 2024:50, 54), these logistical bottlenecks create high trade costs and reduce trade volumes, directly threatening supply chain continuity and the long-term feasibility of the SACU trade model itself and creating a serious need for urgent policy interventions to obviate these underlying problems.

Taken together, these three challenges demonstrate that infrastructure weaknesses, trade barriers and sustainability are cross-cutting and mutually reinforcing. Infrastructure weaknesses (roads, ports, energy) amplify environmental costs and logistical inequalities. Trade barriers—whether carbon taxes, non-tariff measures or inflated transport costs—feed back into structural inequalities and carbon exposure. Fiscal and governance failures further exacerbate these pressures, hindering coordinated investment in sustainable infrastructure and inclusive trade. In this way, SACU's sustainability challenge is systemic: without addressing these interconnected issues simultaneously, the customs union risks locking itself into a vicious cycle of high costs, entrenched inequality, and declining competitiveness, undermining the very feasibility of long-term regional trade integration.

The intersection of these challenges is summed up in figure below.

Figure 7: Intersection of SACU Challenges: Infrastructure, Trade Barriers, and Sustainability.

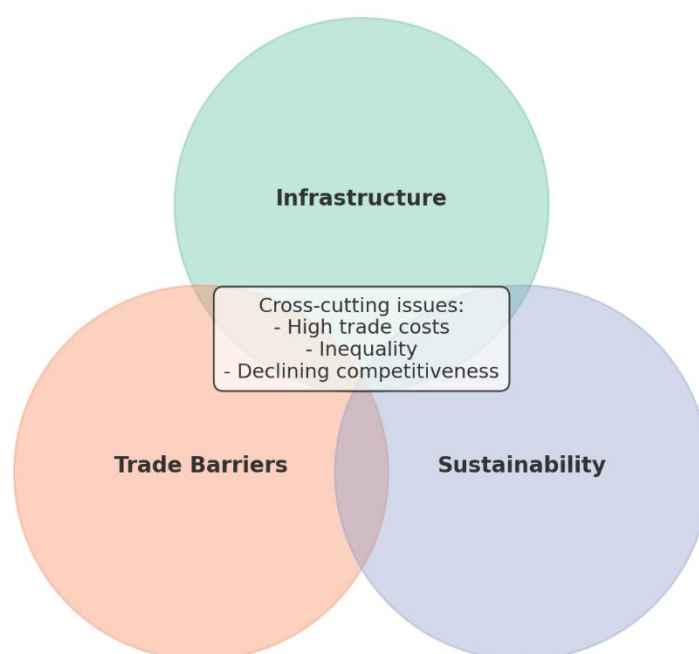


Figure 7: Intersection of SACU challenges: Infrastructure, trade barriers and sustainability. Source: Author's own

4.5 Policy implications and intervention

4.5.1 Policy interventions identified by the SLR literature

The below table (Table 12) provides a synthesised overview of the key academic and policy literature that was examined during the SLR and that identified the challenges and policy intervention opportunities for trade-led development within the SACU.

As mentioned in chapter 3, this study analysed 28 articles and reports published between 2010 and 2025, systematically cataloguing the primary trade impediments identified by researchers and the corresponding policy recommendations proposed to address them. The studies collectively highlight the recurring themes mentioned earlier in this chapter that hinder regional economic integration and growth, including critical infrastructure deficits (in energy, transport, and digital networks), complex regulatory and bureaucratic barriers, economic asymmetries between member states, and limited value-chain integration.

The table serves as a valuable reference tool, allowing policymakers, researchers and stakeholders to quickly identify consensus challenges such as high transport costs and inefficient border posts and explore a range of evidence-based solutions, from modernising infrastructure and harmonising policy interventions to strengthening regional institutions and fostering greater political cooperation. The synthesis below underscores the multifaceted approach required to unlock Southern Africa's full trade potential.

Table 12: Contribution of SLR articles, the challenges identified and the policy recommendation

No.	Article	Challenges to trade	Policy recommendation
1.	South Africa's economic progress: challenges and opportunities for sustainable development (Enaifoghe <i>et al.</i> , 2021). [Q4]	Infrastructure deficits: Electricity shortages and inadequate transport networks hinder production and increase trade costs. Regulatory barriers, including complex visa rules, bureaucratic red tape, and stringent business regulations, stifle cross-border trade and investment. Uncompetitive markets: High barriers to entry and concentrated ownership in key sectors limit competition and efficiency. Policy instability: Inconsistent implementation and a lack of political will create investor scepticism and uncertainty. SACU imbalances: South Africa's global focus (for example, BRICS) can overshadow regional integration, limiting market access for other members.	• Modernise energy, transport, and digital infrastructure. • Lower entry barriers and promote competition to support small businesses. • Strengthen regional frameworks (SACU/SADC) for fairer trade. • Streamline regulations and visa processes to facilitate cross-border movement. • Prioritise growth in labour-intensive sectors like agriculture and tourism for inclusive development
2.	The Prospect of the Proposed Currency Union on Intra-Regional Trade: Southern African Customs Union (Abban, 2020). [Q4]	Infrastructure and logistics: Inefficient transport systems. Institutional and policy barriers: A lack of standard policies. Economic structure: Heavy reliance on the primary sector (minerals, agriculture). Monetary arrangements: The existing system of pegging currencies to the South African Rand still involves transaction costs and exposes members to the volatility of the Rand, discouraging investment and affecting profit margins.	• Adopt a common currency: to eliminate transaction costs and thus reduce exchange rate volatility • Strengthen institutions: Develop a new institutional framework to address non-trade barriers, • Improve fiscal and policy coordination: Members should adhere to standard fiscal convergence criteria and minimise overlapping memberships in other trade blocs to ensure policy alignment. • Diversify Economies: Proactive industrial policy and support for infant industries.
3.	The dynamics of regional economic integration: A system dynamics analysis of pathways to the development of value chains in the Southern African Customs Union (Grobbelaar & Meyer, 2017). [Q3]	Infrastructure deficits: This includes poor road, rail and port infrastructure. Economic asymmetry: South Africa's dominance creates an imbalance, leading to the adoption of protectionist policies—such as regulatory barriers and cumbersome customs procedures. Limited productive capacity: BLNE countries often lack the scale and capability to compete, making them reliant on imports.	• Systemic reforms: simplify customs, invest in infrastructure and harmonise regulations. • Foster value chains: Actively develop cross-border production networks and leverage comparative advantage. • Targeted interventions: Design policies that mitigate economic asymmetries.

4.	Socio-economic implications of South Africa's foreign direct investment in Southern African development (Umezurike <i>et al.</i> , 2016). [Q3]	Economic hegemony: South Africa's economy is significantly larger, accounting for over 80% of SADC's GDP, enabling it to dictate terms. Unfair revenue sharing: SACU's RSF model is criticised. Energy dependency: The BLNE countries are structurally dependent on South Africa's Eskom—protectionist tendencies: South Africa is accused of acting solely in its own interest.	• Incentivise technology transfer, tariff concessions, and tax incentives for African businesses operating in South Africa. • Reform the SACU's RSF to be more equitable. • Commitment to regional integration based on mutual benefit rather than self-interest.
5.	Global market opportunities for SMEs: Export/import perception and trade growth in Lesotho (Oso & Adelakun, 2025) [Q3]	Bureaucratic and administrative hurdles, High trade transaction costs, Infrastructure deficits, non-tariff measures (NTMs), limited access to trade finance and information, concentrated and vulnerable export economy, regulatory and competitive constraints	• Enhance trade facilitation and reduce non-tariff barriers • Improve Physical and Institutional Infrastructure. • Promote export diversification and improve access to finance and information • Leverage regional integration optimally and prepare for the post-AGOA era
6.	The Impact of Trade Policies on SMEs in Windhoek, Namibia: Challenges and Opportunities (Sunde, 2025). [Q2]	Complex bureaucratic procedures for imports/exports cause delays and increased costs. High tariffs and import costs on goods from outside trade blocs reduce profit margins. Intense competition from cheaper, imported goods, particularly from within SACU. Stringent international standards that are difficult and costly to meet. Limited access to information about trade policies and a lack of influence in policy-making processes.	• Simplifying trade procedures through digital one-stop platforms and SME-friendly guides. • Enhancing information access via dedicated trade portals and training workshops. • Strengthening support programs with financial aid for certifications and mentorship. • Calibrating policies to protect vulnerable SME sectors • Encouraging SMEs to network, specialise, and form cooperatives proactively.
7.	The changing context for regional integration in southern Africa: how adaptive are its regional institutions? (Simon, 2010). [Q2]	Weak and overlapping institutions: SACU, SADC, and COMESA. Political nationalism: Member states prioritise national interests. Infrastructure deficits: bottlenecks in transport, energy, and communications. Informal and illicit trade. External pressures: The EU's insistence on bilateral Economic Partnership Agreements (EPAs) has created internal tensions within the SACU. New challenges: Failure to adapt and formulate standard policies on emerging issues like climate change, rapid urbanisation, and the growing economic influence of China and India.	• Strengthening regional institutions: Avoid overlap. • Investing in infrastructure: Prioritising cross-border infrastructure projects to connect markets and facilitate trade. • Fostering Political Cohesion: Building political will among member states to prioritise regional integration over narrow nationalism. • Integrating New Issues: Developing regional strategies to address climate change, urban management, and engagement with external powers like China.

8.	The causes of high intra-regional road freight rates for food and commodities in Southern Africa (Vilakazi, 2018). [Q2]	High transport costs, imbalance in trade flows (lack of return loads), border inefficiencies and delays, limited competition and market concentration. Regulatory barriers: Restrictive regulations, permit systems and protectionist measures.	• Reduce border delays and improve efficiency • Promote competition in the transport sector • Address structural imbalances (lack of return loads) • Improve regulatory frameworks
9.	Estimation of the potential economic welfare to be gained by the South African Customs Union from trade facilitation (Safaeimanesh & Jenkins, 2021). [Q2]	High trade compliance costs. Inefficient administrative systems. Dependence on South African ports. High transaction costs. Limited export diversification. Institutional and political barriers. Corruption, union resistance and a lack of political will impede reforms.	• Implement a Single Window System: This reduces duplication, delays, and costs. • Adopt risk-based customs checks: This speeds up clearance for low-risk trade. • Upgrade trade logistics infrastructure • Enhance regional coordination • Stakeholder engagement and capacity building • Leverage technology: Use existing expertise in South Africa to lead digital transformation.
10.	Factory Southern Africa? SACU in Global Value Chains (Farole, 2016). [Q1]	High transport and logistics costs. Inefficient border crossings. Trade policy barriers. Infrastructure gaps. Scale and asymmetry issues. Regulatory and standards misalignment.	• Infrastructure and logistics improvements: Invest in port expansion, rail upgrades, and intermodal logistics hubs. • Trade facilitation and border modernisation: Implement OSBPs and integrated border management (IBM) systems and deploy electronic single-window systems. • Liberalise and harmonise trade policies: Reduce intra-SACU tariffs and nontariff barriers, especially in agribusiness. • Support for SMEs and regional integration: Create simplified trade procedures and dedicated support mechanisms for small traders. • Enhance regional cooperation • Invest in Skills and Productivity: Address skills gaps, especially in logistics and value-chain management.
11.	Export-led growth hypothesis: Empirical evidence from the Southern African Customs Union	Narrow export base: Most SACU countries rely heavily on a limited range of primary commodities (e.g., diamonds in Botswana and South Africa, textiles in Lesotho, raw minerals in Namibia). Inadequate and poor-quality infrastructure. Capacity constraints and skills shortages.	• Invest in infrastructure and trade-related logistics. • Address skills and capacity shortages. • Diversify the export base.

	countries. (Malefane, 2021). [Q1]	Macroeconomic instability and external shocks. Competitiveness issues: Countries face high production costs and less competitive business environments. Specific sectoral vulnerabilities: Lesotho's textile industry faces stiff "competition from Asian producers". eSwatini is noted for its "vulnerability to climate change", which affects its agricultural exports like sugar.	• Strengthen regional partnerships and collaboration. • Implement targeted, country-specific interventions
12.	Towards promoting African participation in global value chains: Does infrastructure development matter? (Ketu, & Wirajing, 2024). [Q1]	Poor transport infrastructure. Energy poverty: Unstable energy supply disrupts production and increases operational costs for firms—inadequate ICT Infrastructure. Weak water and sanitation infrastructure. Human capital deficits. Governance and institutional weaknesses. Limited FDI and financial development: Inefficient allocation of financial resources toward productive investments (e.g., military spending over trade-enabling infrastructure).	• Invest in infrastructure development: Focus on both quantity and quality of infrastructure to ensure reliability. • Enhance human capital: • Improve governance and institutions. • Attract and manage FDI effectively • Promote trade liberalisation and regional integration • Leverage digitalisation cautiously • Targeted interventions based on income and infrastructure endowment
13.	The capabilities driving participation in global value chains (Pathikonda & Farole, 2016). [Q1]	Logistics and connectivity deficiencies. Infrastructure and physical capital gaps. Institutional weaknesses. Human capital shortages. High trade costs. Geographic disadvantage. Wage competitiveness vs. productivity: While some SACU countries have low wages, low productivity undermines cost competitiveness.	• Invest in trade logistics and infrastructure • Improve trade facilitation and border management • Strengthen institutions and governance: improve transparency and reduce corruption. • Boost human capital and skills development • Enhance market access and input availability • Leverage regional integration • Target sector-specific policies
14.	Trade facilitation for global and regional value chains in SACU (Harmon, 2015). [Q1]	Imbalanced trade and freight flows. High transport and logistics costs. Border inefficiency and lack of harmonisation. Infrastructure capacity and access constraints. Regulatory and fiscal barriers. Economies of scale: The small market size and limited industrial base in BLNE countries make it difficult to achieve economies of scale.	• Addressing Border Inefficiency and Harmonisation: Implement customs modernisation, harmonise non-customs procedures and expand OSBPs. • Alleviating the backhaul problem and reducing transport costs • Supporting SMEs and resolving fiscal barriers • Strategic infrastructure development
15.	Championing a regional spatial data infrastructure:	Fragmented and underdeveloped national spatial data infrastructures (NSDIs) create a disparity that prevents	• Establish a SACU Regional Spatial Data Infrastructure (RSDI): This infrastructure would

	Southern African Customs Union Case (Maphale, 2023). [N/A]	seamless cross-border data sharing and integration. Lack of a regional spatial data infrastructure (RSDI) : This absence makes it challenging to analyse trade flows, environmental impacts, and economic equity from a spatial perspective, which is crucial for evidence-based policy. Institutional and governance challenges: Key hurdles at the national level include a lack of legal frameworks, insufficient funding, and a lack of political support and understanding.	allow for monitoring the environmental impact of trade activities. • Identify a champion and secure a sponsor • Implement a phased, needs-based approach
16.	Balancing power and consensus: opportunities and challenges for increased African integration (Byiers & Miyandazi, 2021) [N/A]	High non-tariff barriers (NTBs) and transport costs. Infrastructure deficits and disconnect. Political economy and competing national interests. Overlapping and complex institutional architecture.	• Full Implementation of the African Continental Free Trade Area (AfCFTA) • Strategic investment in cross-border infrastructure • Improved African Union-REC-Member State coordination • Strengthening regional institutions
17.	Competition, regional integration and inclusive growth in Africa: A research agenda (Roberts <i>et al.</i> , 2017) [N/A]	Poor transport infrastructure and high logistics costs. Regulatory and non-tariff barriers (NTBs). Anticompetitive practices and market dominance. Oligopolistic market structures : characterised by a few multinational firms dominating multiple countries. Political economy and weak institutional coordination. Geographic and structural constraints	• Harmonise competition and trade policies: Strengthen regional competition authorities (e.g., under SADC or SACU) to investigate and prosecute cross-border cartels. • Invest in regional infrastructure • Remove non-tariff barriers • Promote pro-competitive industrial policies: Design industrial policies that support new entrants and SMEs. • Enhance regional cooperation and data sharing • Support competitive entry and diversification: Encourage cross-border investment and entry by firms from within the region to intensify rivalry.
18.	Industrial policy in Southern African regional integration and development (McCarthy, 2014) [N/A]	Inadequate and disjointed physical infrastructure. Policy incoherence and lack of coordination. Institutional weaknesses at the regional level. Economic polarisation and divergent national interests. The overarching challenge of the SACU agreement's design : Fundamental lack of a feasible, agreed-upon strategic framework makes coordinated action on infrastructure and other trade-enabling measures exceptionally difficult.	• Move away from "Common Policies" towards coordination and cooperation • Revisit and redesign the SACU agreement: The paper explicitly calls for a revision of the 2002 SACUA. • Prioritise regional infrastructure development

			• Develop a regional structural development fund: This fund could strategically finance infrastructure. • Integrate services and financial markets
19.	The potential for internal trade and regional integration in Africa (Geda & Seid, 2015) [N/A]	Weak infrastructure and high logistics costs. Lack of export diversification and complementarity. Low competitiveness of African exporters. Inefficient trade facilitation and customs procedures. Macroeconomic policy misalignment and currency issues. Overlapping REC memberships and weak implementation	• Invest in regional and multi-country infrastructure: Prioritise cross-border infrastructure projects (roads, railways, ports, energy, ICT) to reduce trade costs. • Promote export diversification and industrialisation • Enhance trade facilitation and customs modernisation • Strengthen Macroeconomic Policy Coordination • Leverage RECs as vehicles for integration • Build human and institutional capacity • Address Informal trade through formalisation.
20.	Rail and Ports: Challenges and solutions for South Africa's freight system (Department of Transport, 2023b) [N/A]	Inefficiencies in port and rail systems. Poor road infrastructure. Rail system decay. Regulatory fragmentation. Limited maritime capacity. Border delays and cross-border inefficiencies	• Establish a Transport Economic Regulator (TER): Aims to create a single regulator to improve pricing efficiency, reduce trade costs, and enhance competitiveness. • Promote rail freight migration • Enhance port and rail competition • Modernise road infrastructure • Maritime sector reform • Regional Integration Strategy: To harmonise transport policies and infrastructure development across SADC and SACU and improve cross-border corridors like the Trans-Kalahari Corridor. • Leverage Technology and Innovation.
21.	Annual State of Cross-Border Operations Report (C-BRTA, 2022) [N/A]	Poor road infrastructure. Inefficient border posts. Multiple law enforcement inspections. Weighbridge delays. Lack of cross-border facilities. Regulatory fragmentation. Corruption and informal payments. Xenophobic attacks and driver conflicts. Funding and skills shortages	• Hard infrastructure reforms • Technology-driven reforms • Soft infrastructure reforms • Operational and institutional reforms
22.	The Southern African Customs Union (SACU)	Inefficient border posts and cross-border procedures: Manual and paper-based processes lead to delays, increased costs, and	• Modernise and digitise trade processes: Enhance IT connectivity and data exchange

	Integrated Annual Report 2024 (SACU, 2024) [N/A]	inefficiencies. Inadequate physical infrastructure. Digital divide and technological gaps. Regulatory and operational fragmentation: Differing national standards, procedures, and regulatory requirements create non-tariff barriers, resulting in limited regional value chain integration. Additionally, there is a lack of coordinated investment in cross-border infrastructure projects. Institutional coordination challenges: Difficulty in achieving quorum for key decision-making meetings.	between member states to improve transparency and efficiency. • Invest in physical infrastructure • Harmonise policies and procedures • Strengthen institutional frameworks • Promote regional value chains: Facilitate investment in cross-border industrial projects and special economic zones. • Leverage AfCFTA opportunities • Enhance public-private collaboration: Engage with the private sector to co-design and implement trade facilitation initiatives.
23.	Regional Trade Integration and Regional Value Chains in Africa: Implications for the Africa Continental Free Trade Area Agreement (Nare & Alhassan, 2024) [N/A]	Poor infrastructure: Landlocked countries face significantly higher trading costs. Low domestic value addition: African economies, including those in SACU, are characterised by a low capacity to add value to their raw materials. This limits their ability to move up the value chain. Data gaps and measurement issues: The study highlights data availability gaps as a major challenge for economic analysis in Africa. Unequal distribution of benefits. High trade costs for landlocked nations	• Strategic investment in infrastructure • Promote domestic value addition and industrialisation • Implement trade facilitation measures • Capacitate SMEs • Foster regional coordination and compensatory mechanisms: recs like SACU should implement agreed-upon reforms and pursue a holistic approach from country to regional level. This includes leveraging the AfCFTA to create larger markets and opportunities.
24.	The road maintenance backlog in South Africa (Ross & Townshend, 2018) [N/A]	Massive road maintenance backlog. Severe deterioration of provincial and municipal roads. Chronic underfunding and budgetary constraints. The dependent liability of unclaimed roads. Inefficiencies and capacity constraints.	• Develop an integrated funding model: Public-Private Partnerships (PPPs) for specific high-volume corridors critical for trade. • Strategic prioritisation of road investment: • Cost-effective asset management • Rationalisation of the road network • Improving Data and Governance: Addressing discrepancies in road ownership data and standardising cost reporting.
25.	Linking Southern Africa into South Africa's global value chains (Banga & Balchin, 2019) [N/A]	Infrastructure deficits. Non-tariff barriers (NTBs). Supply-side constraints. Regulatory and policy misalignment. Skills shortages. Asymmetry between South Africa and other SACU Members.	• Policy recommendations for sustainable trade • Supplier capacity development: Encourage South African lead firms to mentor regional suppliers to meet quality and volume standards.

			• Regulatory harmonisation: Develop common regional standards and strengthen accreditation systems. • Investment in infrastructure • Leverage digital technologies • Regional investment frameworks: Develop an intra-regional investment framework to attract productive investments into sectors with high potential for regional value chain integration. • Enhanced regional cooperation • Targeted Sectoral Policies: Focus on priority sectors such as agricultural-processing, automotive, and textiles where regional complementarities exist.
26.	The South Africa – UK International Economic Partnership (IEP): Trade Policy Research Priorities for South Africa (Edwards <i>et al.</i> 2024) [N/A]	Port inefficiencies. Rail and logistics performance: Transnet’s operational failures have led to significant declines in rail capacity. Energy supply constraints, including load-shedding and electricity shortages, disrupt production and export capabilities, particularly in energy-intensive sectors such as metals and manufacturing. Administrative and customs delays. Weak regional integration: Despite SACU and SADC agreements, logistical and NTBs persist.	• Infrastructure investment and modernisation: • Trade facilitation measures: Simplify customs procedures and adopt digital systems to reduce delays. • Energy sector reform • Regional cooperation and integration • Support for SMEs and exporters: • Gender-inclusive trade policies
27.	A Monitoring and Evaluation Sustainability Framework for Road Freight Transporters in South Africa (Lalendle <i>et al.</i> , 2021) [N/A]	Overreliance on road freight transport. Deteriorating road infrastructure. High negative externalities. Inefficiencies in freight operations. Regulatory and policy gaps. Safety concerns: High rates of accidents, fatalities, and injuries related to HGVs. Limited modal shift: Inadequate policies or incentives to shift freight from road to rail, despite rail being more sustainable.	• Adopt a holistic sustainability assessment tool: use Monitoring and Evaluation (M&E) frameworks to evaluate and improve sustainability across social, economic, and environmental dimensions. • Promote cleaner technologies and fuels. • Improve infrastructure management • Enhance regulatory compliance: Support certifications like RTMS (Road Transport Management System) and SQAS (Safety Quality Assessment for Sustainability). • Incentivise Sustainable Practices • Stakeholder engagement: Include freight owners, government, and communities in

			decision-making to ensure shared responsibility. • Data-driven decision-making: Use indicators from the M&E framework to guide infrastructure and operational investments. • Shift to Intermodal Transport
28.	Southern African Customs Union (SACU) (Ndzama, 2025) [N/A]	Infrastructure and energy deficits. Regulatory and border constraints. Economic and structural disparities. Limited value chain integration	• Develop a regional industrial development policy • Focus on trade facilitation • Improve monetary and fiscal policy coordination • Invest in regional infrastructure • Inclusive trade programs • Leverage external partnerships: SACU should strategically leverage its existing external trade agreements to attract investment.

Table 12: Policy implication articles

The outcomes of the SLR revealed several critical insights into the sustainability of intra-SACU trade.

Firstly, the sustainability of intra-SACU trade is critically undermined by persistent and interconnected infrastructure challenges. The literature reveals a strong consensus that both hard infrastructure deficits—such as chronic electricity shortages, deteriorating road and rail networks, and port inefficiencies—and soft infrastructure barriers—including cumbersome customs procedures, bureaucratic red tape and non-tariff measures—combine to create a high-cost, inefficient trading environment (see articles 3, 10, 20, 21, 26). These constraints are particularly debilitating for the BLNE countries, whose landlocked status exposes them to exorbitant transport costs and structural dependence on South Africa’s ports and energy grid.

While airfreight presents a viable alternative niche for enhancing intra-SACU trade in specific high-value, time-sensitive sectors such as premium processed foods, fresh produce, and pharmaceuticals—by bypassing the debilitating road and border delays identified in the literature, its prohibitive cost, often 15-20 times that of road freight, renders it irrelevant for the bulk commodities that dominate current trade such as fuel (WITS, 2023). Its strategic value lies not as a systemic alternative but as a complementary tool that can support export diversification and regional value chain development for agile SMEs, contingent on supportive policies like reduced airport charges and streamlined aviation regulations. However, airfreight does not address the root causes of unsustainable trade flawed institutional design and infrastructure deficits and should be integrated within the essential dual-track strategy of major physical infrastructure investment and deep policy reform, lest it become merely an expensive workaround for a privileged few within a failing terrestrial system.

Secondly, these physical and bureaucratic hurdles are compounded by the profound economic asymmetry within SACU. South Africa dominates the bloc, generating over 80% of SACU’s GDP (see articles 3, 4, 18). This dominance fosters a core–periphery relationship, where the BLNE states primarily serve as importers of South African goods and exporters of raw materials. The lack of export diversification among member states exacerbates this imbalance, leaving them reliant on narrow commodity bases, vulnerable to external shocks, and unable to advance up the value chain (see Articles 2 and 11). This asymmetry also creates political tensions, with frequent accusations that South Africa

prioritises its own interests, thereby weakening the political will for deeper regional integration (see article 7).

Thirdly, the policy recommendations presented in the literature are comprehensive, addressing both the hard and soft dimensions of the problem. The most consistent proposals include large-scale, coordinated investments in regional infrastructure, particularly cross-border projects in energy, transportation, and digital connectivity, aimed at reducing logistics costs (see articles 9, 10, 12, 20, 22, 26). Equally important are deep trade facilitation reforms, such as implementing digital Single Window systems, expanding one-stop border posts (OSBPs), and harmonising regulations to reduce non-tariff barriers (articles 2, 6, 9, 14, 17, 18). To address structural economic imbalances, recommendations emphasise developing regional value chains (especially in agricultural processing), supporting SMEs, and diversifying exports to create more resilient and inclusive economies.

A key insight from the review is the difference in perspective between academic sources and institutional reports. Academic studies (Q1–Q4) tend to highlight root causes and systemic failures, such as flaws in SACU's institutional design and macro-economic misalignments. In contrast, institutional and grey literature (N/A) provides granular, operational insights, highlighting real-world constraints such as weighbridge delays, driver disputes, and port inefficiencies. Taken together, these perspectives reveal that while the solutions are well understood, they often fail due to constraints imposed by the political economy and institutional weaknesses.

In summary, the SLR indicates that while the potential for sustainable intra-SACU trade is substantial, its current trajectory is unsustainable. Infrastructure deficits erode competitiveness, reinforce dependency, and hinder diversification. Achieving sustainability, therefore, requires a dual-track strategy: (1) large-scale infrastructure investment, and (2) profound policy reform, underpinned by genuine political commitment to regionalism over nationalism. Without such a concerted effort, intra-SACU trade will remain vulnerable and fail to achieve its potential as an engine of inclusive and sustainable growth.

The following section outlines an implementation roadmap for the policy actions required to enhance the sustainability of intra-SACU trade, considering the existing challenges identified through the SLR.

4.5.2 Implementation roadmap to make intra-SACU trade more sustainable

Table 13 presents an implementation roadmap for the policy actions required to enhance the sustainability of intra-SACU trade. The findings inform these policy actions of the systematic literature review (SLR) and constitute a coherent, multi-stage strategy aimed at strengthening and sustaining regional trade. The roadmap's effectiveness is contingent upon directly addressing the substantial infrastructure and regulatory challenges highlighted in the preceding section (Table 12). The implementation timeline is categorised into three phases: immediate actions, medium-term actions and long-term actions. Achieving sustainable intra-SACU trade extends beyond merely increasing trade volumes; it encompasses the development of a resilient, efficient and equitable regional economic system. When implemented in alignment with the identified challenges, this roadmap provides a practical and evidence-based pathway toward achieving these objectives.

Table 13: Implementation roadmap

Timeline	Actions
Immediate (1-2 years)	• Digitise trade processes: Implement digital one-stop platforms and electronic single-window systems at key borders. • Launch an NTB removal campaign: Form a dedicated task team (DTT) to identify and eliminate specific regulatory bottlenecks. • Create a trade information portal: Establish a single, authoritative SACU-wide online source for all trade rules and procedures. • Initiate emergency infrastructure repairs: Prioritise maintenance and upgrades for key road/rail corridors and port equipment.
Medium term (3-5 years)	• Establish a dedicated SME support facility: Provide targeted grants, trade finance, and mentorship programs. Diversify energy. • Achieve regulatory harmonisation: Fully harmonise standards in one high-impact sector (e.g. agricultural processing) as a proof of concept. • Secure high-level political commitment: Host a summit to reaffirm commitment to SACU integration and deprioritise nationalistic policies. • Diversify energy.
Long term (5 plus years)	• Develop sophisticated regional value chains: Transform from a raw material exporter to a hub for finished goods in targeted sectors. • Achieve deep policy integration: Move towards a fully harmonised regulatory environment and coordinated macroeconomic policies.

	• Complete an integrated multi-modal network: Finalise a seamless, climate-resilient regional transport and energy grid. • Adopt common currency and environmental standards • Revise revenue sharing to support BLNE industrialisation
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Table 13: Policy implementation roadmap

Immediate actions (1–2 Years): Addressing critical challenges in intra-SACU trade

The immediate phase of the roadmap prioritises interventions that deliver rapid improvements by targeting the most critical barriers to cross-border trade, as identified in the synthesised literature (see Table 12). Central to this phase is the implementation of digital one-stop platforms and electronic single-window systems, which directly address inefficiencies at border posts and cumbersome bureaucratic procedures (SACU, 2024; Sunde, 2025; Safaeimanesh & Jenkins, 2021). The continued reliance on manual and paper-based processes significantly exacerbates delays, inflates transaction costs and creates opportunities for corruption. Transitioning to digital systems represents the most effective strategy for mitigating Non-Tariff Barriers (NTBs), a recommendation consistently highlighted in the literature.

The establishment of a *Dedicated Task Team* (DTT) is another critical intervention, given that NTBs often consist of obscure, context-specific regulations rather than formalised barriers. This initiative directly addresses the challenges of regulatory and operational fragmentation (SACU, 2024) as well as restrictive permit systems (Vilakazi, 2018), which hinder trade despite the existence of the customs union. Complementing this, the creation of a centralised trade information portal addresses the information asymmetries that disproportionately affect SMEs (Sunde, 2025; Oso & Adhlakun, 2025). By providing transparent access to trade regulations and procedural guidance, the portal enables smaller businesses to participate in regional trade, thereby promoting inclusive and sustainable economic growth.

Emergency infrastructure maintenance represents the most urgent short-term action to preserve the functionality of the Union’s trade network. Evidence from Table 11 underscores persistent deficits in energy supply (Enaifoghe *et al.*, 2021), deteriorating transport infrastructure (Ketu & Wirajing, 2024; C-BRTA, 2022a) and operational inefficiencies in ports and rail networks (Department of Transport, 2023b; Edwards *et al.*, 2024). The degradation of critical road and rail corridors, combined with energy shortages, directly increases trade costs and undermines production reliability. Prioritising

maintenance of key corridors is therefore a necessary precursor to larger-scale infrastructural projects, aligning with prior recommendations to invest in robust transport and energy systems (Ketu & Wirajing, 2024; Pathikonda & Farole, 2016).

Medium-term actions (3–5 Years): Deepening integration and addressing structural constraints

The medium-term phase emphasises the development of deeper structural capacity and political alignment to enable sustainable trade. Establishing a dedicated SME support facility constitutes a core intervention, given the persistent challenges faced by SMEs, including limited access to trade finance, information and the capacity to comply with international standards (Oso & Adelakun, 2025; Sunde, 2025). Such a facility would provide targeted grants, financial support and mentorship, foster competitive SMEs and diversifying the regional economy beyond its dependence on raw materials (Abban, 2020; Malefane, 2021). Prioritising high-impact sectors, such as agricultural processing, offers a strategic proof of concept, addressing regulatory misalignment (Farole, 2016) and policy incoherence (McCarthy, 2014) that currently impede the development of regional value chains (RVCs). Harmonisation of standards and reduction of compliance costs would enable producers to operate on a regional scale, enhancing competitiveness.

Securing high-level political commitment is also pivotal to addressing the root causes of many trade challenges, including political nationalism (Simon, 2010) and insufficient political will (Safaeimanesh & Jenkins, 2021; Enaifoghe et al., 2021). Table 12 demonstrates that economic asymmetries within the Union contribute to protectionist tendencies (Umezurike et al., 2016; Grobbelaar & Meyer, 2017). Convening a political summit to reaffirm SACU commitments would be a critical step toward overcoming divergent national interests (McCarthy, 2014) and enabling collective action on infrastructure and policy reforms. Additionally, diversifying energy sources is essential, given the dependency of BLNE countries on South African energy and the domestic supply constraints within South Africa itself (Umezurike *et al.*, 2016; Edwards *et al.*, 2024). Energy diversification underpins industrialisation and ensures the stability of regional trade networks.

Long-term actions (5+ years): Realising a sustainable and integrated regional economy

The long-term vision focuses on transforming SACU from a conventional customs union into a fully integrated and competitive economic bloc. A primary objective is the development of sophisticated RVCs to facilitate the transition from raw material exports to the production of finished goods, addressing current limitations in domestic value addition (Nare & Alhassan, 2024) and low regional value chain integration (SACU, 2024). By leveraging comparative advantages across Member States, RVCs would foster interdependencies that enhance resilience and economic equilibrium within the Union.

Achieving deep policy integration represents the next step, encompassing harmonisation of macroeconomic policies in addition to standards. This strategy addresses macroeconomic misalignments (Geda & Seid, 2015) and supports coordinated fiscal and monetary policy (Abban, 2020; Ndzama, 2025), which are essential for mitigating economic disparities within the SACU.

Infrastructure development in this phase targets the completion of an integrated, multi-modal transport network. Moving beyond emergency repairs, the objective is to create a seamless, climate-resilient system that bridges current infrastructure gaps and promotes a modal shift from road to rail transport (Department of Transport, 2023b; Farole, 2016; Lalendle *et al.*, 2021).

Further transformative goals include adopting a common currency, establishing shared environmental standards and revising the revenue-sharing formula (RSF). A common currency would eliminate transaction costs and reduce exchange rate volatility, while revising the RSF addresses concerns regarding inequitable revenue distribution (Abban, 2020; Umezurike *et al.*, 2016) and facilitates industrialisation in BLNE countries, thereby rebalancing intra-Union economic disparities.

In summary, the phased roadmap presented in Table 13 is a direct response to the documented challenges constraining intra-SACU trade. Its sustainability relies on a sequential approach: immediate digitalisation and NTB reduction to lower costs; medium-term support for SMEs and regulatory harmonisation to broaden participation; and long-term development of value chains, deep integration and resilient infrastructure to generate enduring economic value. Table 12 both justifies the roadmap and underscores

the consequences of inaction. Without systematic intervention, infrastructure decay, regulatory fragmentation and political inertia will continue to undermine intra-SACU trade. The proposed roadmap offers an evidence-based pathway to build a more efficient, inclusive and resilient regional trading system.

4.6 Summary of findings and discussion

This chapter has demonstrated that infrastructure deficits, inequality and regulatory fragmentation are central to understanding the sustainability of intra-SACU trade. South Africa's dominant position continues to shape regional dynamics, while smaller member states contend with inadequate transport networks, high logistics costs, and weak policy alignment. These interrelated factors collectively undermine regional resilience and constrain SACU's capacity to capitalise on broader trade opportunities.

Several critical issues, however, remain under-explored. First, the systematic literature review (SLR) methodology employed in this study ensures high credibility, yet it inherently limits the representation of certain stakeholder perspectives, such as those of freight operators and border communities. This highlights a gap between academic and policy insights and the practical realities of cross-border trade. Second, while the literature largely identifies infrastructure deficits as a limiting constraint, other dimensions also play significant roles: some studies emphasise policy misalignment, whereas others point to governance challenges or entrenched inequalities. Recognising these tensions is essential, as it underscores the fact that the SACU's trade challenges are multi-dimensional and cannot be attributed to a single cause. Third, the absence of integrated data systems constrains both research and policy design, suggesting that future studies should combine SLR evidence with empirical methods—such as firm-level surveys or corridor case studies—to capture under-represented perspectives.

Regarding sustainability, intra-SACU trade is currently at risk. Existing infrastructure is not only inadequate but, in many instances, deteriorating, creating a high-cost and inefficient trading environment that erodes competitiveness across the Union. Both academic and institutional literature converges on the conclusion that sustainable trade requires reliable physical and digital infrastructure as a foundation. Without such a foundation, efforts to harmonise policies, integrate value chains and strengthen SME participation are unlikely to achieve a meaningful impact.

Therefore, a sustainable future for intra-SACU trade requires a dual strategy: coordinated, large-scale investment in regional infrastructure, alongside comprehensive regulatory harmonisation and reinforced political commitment to regional integration over narrow national interests. Conceptually, the findings suggest a framework in which elevated trade costs exacerbate inequality, reduce competitiveness and threaten long-term sustainability. Incorporating such a model would strengthen future research by clarifying these interdependencies. Finally, forward-looking evidence suggests that unless SACU addresses these systemic weaknesses by 2030, its ability to capitalise on opportunities arising from the AfCFTA and emerging digital trade reforms will remain constrained. In sum, the findings not only describe past and current realities but also serve as a cautionary signal of the future risks posed by delayed structural reforms.

4.7 Limitations of the SLR literature

While the literature reviewed provides valuable insights into the infrastructure challenges affecting intra-SACU trade, it is not without limitations.

Geographic bias

A significant proportion of the literature is focused on South Africa, which may result in a geographic bias. While South Africa is the largest trade partner within the SACU, the experiences of smaller and landlocked countries, such as Lesotho and Botswana, may be under-represented in the literature. This limits the applicability of the findings to the entire SACU region.

Lack of empirical data

Another limitation of the literature is the lack of empirical data on the actual costs and impacts of infrastructure inefficiencies in SACU trade. Many studies rely on theoretical frameworks or qualitative assessments, which may not fully capture the scale of the problem or provide concrete evidence of the economic impact of infrastructure challenges.

Recent studies

Most studies included in the review were published before 2020, with a noticeable gap in more recent research. Given the rapidly changing infrastructure landscape in Southern

Africa, more recent studies could provide updated insights into the current challenges and the effectiveness of recent policy interventions.

Chapter 4: Conclusion

This chapter has synthesised the findings of the systematic literature review, highlighting the critical infrastructure deficits, trade barriers and sustainability-related challenges that shape intra-SACU trade. The analysis demonstrates that these challenges are interconnected, creating structural constraints that limit the Union's capacity to achieve resilient, inclusive and competitive regional integration. Notably, the literature highlights the importance of targeted policy interventions in addressing these challenges and promoting more sustainable trade practices.

Building on these insights, the chapter presents a multi-stage implementation roadmap designed to strengthen and sustain intra-SACU trade. By dividing the timeline into immediate, medium-term and long-term actions, the roadmap provides a structured approach to tackling both urgent challenges and systemic structural issues. When executed effectively, these actions not only facilitate trade growth but also contribute to the development of a resilient, efficient, and equitable regional economic system.

Ultimately, the findings and proposed roadmap underscore that sustainable intra-SACU trade requires more than expanding trade volumes; it demands coordinated policy responses, strategic infrastructure investments, and a long-term commitment to regional integration. This chapter thus provides both the evidence base and practical guidance necessary to inform policy decisions aimed at achieving a stronger and more sustainable SACU. The chapter concludes with discussions surrounding the limitations of the SLR literature.

Chapter 5: Discussion and synthesis of findings

5.1 Introduction

This chapter synthesises, interprets, and contextualises the research findings to assess the sustainability of intra-SACU trade amid infrastructure challenges. It bridges the theoretical foundations from Chapter 2 and the empirical evidence from Chapter 4.

The following section begins with a concise overview of the key findings from both literature reviews. It will compare the traditional and systematic reviews to identify points of convergence and divergence, demonstrating how the systematic review refined or challenged established narratives. The below overview provides the necessary foundation for the following integrated analysis and discussion.

5.2 Overview of key findings from the traditional literature review (TLR)

The TLR started by introducing the conceptual foundation for understanding intra-SACU trade through key trade theories. Classical theories, such as David Ricardo's theory of comparative advantage, explain the rationale for specialisation and trade based on efficiency (Cited by Ruffin, 2002). These are complemented by modern frameworks such as the Heckscher-Ohlin model, which emphasises factor endowments, and Paul Krugman's New Trade Theory, which incorporates economies of scale and imperfect competition (Kopp, 2024; Krugman, 1979). In the context of the SACU, these theories highlight both the potential for mutually beneficial trade and the persistent structural imbalances, notably South Africa's economic dominance, which skews benefits and hinders deeper integration (Chimuka *et al.*, 2024: 56-57; Ndzama, 2025: 271).

In addition to this, the traditional literature review also presented a more subtle assessment of the importance of trade and trade openness for economic growth. At the same time, some authors like Gava *et al.* (2025: 5-6) and ElGanainy *et al.* (2023: 5-6, 13-14) find a positive relationship between trade openness and growth, other authors, such as Lee *et al.* (2024) and Kutu and Ohonba (2024), find limited empirical evidence to prove that trade liberalisation (alone) has been the primary driver of economic growth in the SACU. The traditional literature review also showed that the benefits of openness, including productivity gains and technological diffusion (Hsu & Pereira, 2022), are not automatic and are often constrained by high trade costs, tariff complexity, weak infrastructure and inefficient border management in the region (Ohnsorge & Quaglietti,

2023; Malefane & Odhiambo, 2017). Furthermore, trade openness can also exacerbate distributional inequities, evidenced in the significant trade imbalances between South Africa and the smaller BLNE countries (Lee *et al.*, 2024).

The literature chapter then progressed to regional integration, identifying it as a critical mechanism for amplifying the benefits of trade openness by creating larger markets, reducing trade barriers, and fostering policy coordination (Ndzama, 2025; Garba & Wancelous, 2023). For SACU, integration aims to facilitate the free movement of goods and services, supported by a standard external tariff (CET) and a revenue-sharing formula (RSF) that provides fiscal stability for smaller members (SACU, 2022). However, the realisation of these benefits is threatened by entrenched economic disparities, primarily, South Africa's hegemony in benefit distribution and most critically, the significant infrastructure deficits in SACU (Woyo & Tafirenyika, 2025). The deficits in transport and logistics, specifically, severely constrain regional connectivity and the ability of landlocked members to integrate into value chains.

Chapter 2 also highlighted the fact that the potential of trade openness and regional integration is contingent upon the quality of trade infrastructure and facilitation. Efficient infrastructure is a core enabler of market accessibility, reducing transaction costs and supporting integration (Olapoju, 2023; Gachunga & Kuso, 2019). Empirical evidence suggests that infrastructure investment is strongly associated with increased trade and income (Han & Li, 2022). Within SACU, the region's heavy reliance on South Africa's road network creates a vulnerability in this area, as deficiencies in this and other infrastructure lead to inflated trade costs and undermine competitiveness (Vilakazi, 2021; Malefane & Odhiambo, 2017). Trade facilitation measures, such as one-stop border posts (OSBPs) and digital customs systems, are therefore essential in SACU; however, their effectiveness is limited without parallel investment in physical “hard” infrastructure (Ohnsorge & Quaglietti, 2023; Vincent & Njong, 2021).

The empirical overview section of the traditional literature review also utilised established indices, such as the Global Competitiveness Index (GCI), the Logistics Performance Index (LPI), and the Road Quality Index (RQI), to gain a comprehensive understanding of infrastructure performance within SACU in terms of transport efficiency, logistics capabilities and regional connectivity. The inclusion of the EAC as a benchmark for the SACU was because of its structural and economic similarities to the SACU. South Africa consistently ranks highest among the SACU and EAC members in terms of infrastructure

performance, but the situation has been deteriorating and is hampered by several inefficiencies (Schwab, 2019: 19; DBSA, 2024: 38). Botswana and Namibia also perform relatively well, while Lesotho and Eswatini significantly lag behind. The comparative analysis further revealed that SACU generally outperforms its counterparts in Africa (and the EAC) but still falls short of global medians, highlighting a persistent infrastructure divide and the urgent need for targeted investment to address intra-regional disparities that weaken collective trade capacity (World Bank, 2023; Moszoro & Soto, 2022).

Finally, the review identifies significant gaps in the existing literature. These include a predominant focus on economic indicators, such as GDP and trade volumes, at the expense of analysing the physical impact of physical infrastructure constraints (Safaeimanesh & Jenkins, 2021; Vilakazi, 2018). A disconnect also seems to exist between trade policy assumptions and infrastructure realities and there is a lack of incorporation of social and environmental dimensions into sustainability assessments (Lalendle *et al.*, 2021). Furthermore, the literature suffers from a scarcity of standardised, SACU-specific valuation frameworks to evaluate policies and investments. Current policy recommendations often prioritise trade facilitation measures over the essential physical infrastructure upgrades needed to support them (Tandrayen-Ragoobur *et al.*, 2022). This fragmentation across economic, logistical and sustainability research necessitates a more integrated analytical framework, which the SLR (Chapter 4) aimed to provide.

5.3 Overview of key findings from the systematic literature review (SLR)

The findings of the SLR in chapter 4 revealed that the sustainability of intra-SACU trade is critically undermined by a triad of deeply interconnected challenges: infrastructure deficits, non-tariff barriers (NTBs), and systemic sustainability concerns.

The most common challenge identified by the SLR is the severe infrastructure deficit that exists across both physical and digital domains in the SACU. The SLR resoundingly highlights poorly maintained road and rail networks, inefficient border posts and unreliable energy supplies as primary obstacles (SACU, 2024:39 & 53; Department of Transport, 2023a; Department of Transport, 2023b:34-37; Department of Transport, 2023c: 26-45). These deficiencies directly translate into increased logistical costs, extended transit times and heightened vulnerability to external shocks, severely diminishing the competitiveness of goods traded within the union (Malefane, 2021:65-66). Port bottlenecks and energy instability further disrupt supply chains, particularly for landlocked member states

(Botswana, Eswatini and Lesotho). A lack of interoperable digital systems constrains automation and data exchange, deepening disparities and limiting e-commerce adoption (SACU, 2024: 89 & 104). The SLR also revealed that the infrastructure challenges in SACU are systemic, extending beyond physical assets to encompass deeper governance, regulatory, and institutional inefficiencies, such as fragmented authority, poor coordination, and chronic underfunding, that create bottlenecks even where physical infrastructure does exist.

Compounding these physical constraints is the complex web of non-tariff barriers (NTBs) that exist in the SACU. The SLR findings reveal that cumbersome customs procedures, a lack of harmonisation in sanitary and phytosanitary (SPS) standards and restrictive transport regulations act as a significant hidden tax on intra-SACU trade (Ndzama, 2025:279; C-BRTA, 2022a:2). The compliance costs associated with these procedures often far exceed those of tariffs themselves, creating substantial economic inefficiencies (Safaeimanesh & Jenkins, 2021:9-11). A critical underlying issue is the gap between policy agreement and implementation, driven by a lack of political will and institutional weaknesses, which allows protectionist domestic policies to override regional commitments and fosters an unpredictable trading environment, especially harmful to SMEs (Farole, 2016:60; Ketu & Wirajing, 2024:12-14). Furthermore, these administrative NTBs are powerfully magnified by the physical infrastructure challenges, with port congestion and rail failures worsening the delays and costs created by bureaucratic hurdles, creating a vicious cycle that stifles trade (C-BRTA, 2022a; Department of Transport, 2023a).

The sustainability of intra-SACU trade is threatened on multiple fronts. Environmentally, the heavy reliance on road freight responsible for 91.2% of the transport sector's greenhouse gas emissions creates a significant carbon footprint and exposes member states to potential carbon border taxes in key export markets, eroding the price competitiveness of regional exports (Lalendle *et al.*, 2021:3; Edwards *et al.*, 2024:59). Economically, vast inequality is entrenched by vast infrastructure disparities between South Africa and the BLNE states, with South Africa accounting for 97% of intra-SACU trade (Harmon, 2015:3). This core-periphery relationship is perpetuated by a revenue sharing formula (RSF) that creates fiscal dependency for BLNE nations, disincentivising their industrial development and economic diversification and locking them into a role as

importers of South African goods and exporters of raw materials (Abban, 2020:759; Banga & Balchin, 2019:4).

Adjusting the SACU Revenue Sharing Formula is a sovereign political process governed by the 2002 Agreement, yet its structure has remained largely unchanged for decades due to several entrenched obstacles. The fundamental barrier is the requirement for unanimous consensus among all five member states, a high threshold given their divergent economic interests and sizes, where any perceived loss necessitates a compensatory gain for another. This challenge is compounded by institutional delays, such as the repeated failure to convene crucial meetings like the Ministerial Retreat due to a lack of quorum, which has stalled strategic dialogues. Furthermore, ongoing reviews of SACU's institutional effectiveness and capacity constraints have slowed decisive action. The formula's immense material significance—directly determining the disbursement of billions in critical annual revenue, as evidenced by the R159.5 billion distributed in 2023/24—makes any proposed adjustment a high-stakes negotiation (SACU, 2024). Consequently, the formula has persisted, even as its shortcomings are widely acknowledged, with substantive change now contingent on the broader and currently active political process to "reimagine" the future of SACU itself.

A further long-term feasibility concern is the ageing infrastructure and massive maintenance backlog, exemplified by the estimate that 78% of South Africa's national road network has exceeded its designed life, raising systemic risks of collapse for the entire regional trade network (Lalendle *et al.*, 2021:3; Ross & Townshend, 2018).

A key insight from the SLR is the cross-cutting and mutually reinforcing nature of these challenges. Infrastructure weaknesses exacerbate environmental costs and logistical disparities, while trade barriers perpetuate structural inequalities. This creates a vicious cycle where high costs, entrenched inequality and declining competitiveness undermine the very feasibility of long-term regional trade integration, as illustrated by the feedback loops of environmental unsustainability, economic inequality, and infrastructure collapse detailed in the chapter (Section 4.4). The synthesis also revealed a subtle difference in perspective: academic sources (Q1-Q4) tended to highlight root causes and systemic failures, such as the flawed SACU agreement design, while institutional reports provided granular, operational insights into real-world constraints, including weighbridge delays and driver disputes.

In terms of policy recommendations, the SLR literature converges on the necessity of integrated policy interventions to address these cross-cutting challenges. Recommendations are holistic, advocating for large-scale, coordinated investment in regional infrastructure to close both hard and soft infrastructure gaps (Ketu & Wirajing, 2024; Pathikonda & Farole, 2016). Deep trade facilitation reforms—such as implementing digital Single Window systems, harmonising regulations and establishing one-stop border posts (OSBPs)—are emphasised as critical to reducing NTBs (SACU, 2024; Safaeimanesh & Jenkins, 2021). Furthermore, policy actions must aim to dismantle structural economic imbalances by developing regional value chains, supporting SMEs, and revising the RSF to incentivise industrialisation in BLNE countries (Nare & Alhassan, 2024; Ndzama, 2025). These findings directly informed a phased implementation roadmap outlining immediate (1-2 years), medium-term (3-5 years) and long-term (5+ years) actions. This roadmap provides a coherent strategy, beginning with digitalisation and NTB removal, moving through SME support and regulatory harmonisation and culminating in the development of sophisticated regional value chains and deep policy integration to build a resilient, efficient, and equitable regional economic system.

Having established these comprehensive findings, the subsequent section compares the results derived from the traditional literature review (TLR) with those of the systematic literature review (SLR) to highlight the methodological strengths and nuanced insights offered by the SLR approach.

5.4 Comparison of TLR and SLR Findings

A comparative analysis of the traditional literature review (TLR) from Chapter 2 and the systematic literature review (SLR) from Chapter 4 identified the following areas of convergence, divergence and refinement in this study.

Both the TLR and SLR consistently identify several core challenges that undermine the sustainability of intra-SACU trade:

Infrastructure deficits as a primary barrier: Both reviews highlight severe deficiencies in physical infrastructure, such as roads, rails, ports and energy systems as a primary barrier to trade. The TLR notes that infrastructure gaps increase trade costs and hinder regional integration (Malefane & Odhiambo, 2017; Vilakazi, 2021), using indices such as the LPI, RQI and GCI to empirically demonstrate that while South Africa outperforms its

neighbours, the entire region lags behind global standards. The results from the SLR confirm this and highlight that the infrastructure deficits in SACU lead to high logistical costs, extended transit times, and supply chain vulnerabilities (SACU, 2024; Department of Transport, 2023abc). The SLR also showed that South Africa's road maintenance backlog is estimated at R75-R200 billion (Tetley *et al.*, 2022; Department of Transport, 2023abc). Transnet's rail and port failures are costing the economy billions (Edwards *et al.*, 2024), and erratic power supply at border posts halt electronic customs clearance, exacerbating the problem (C-BRTA, 2022). This is of concern, given the importance of South Africa's road network for intra-SACU trade. The SLR moves from the TLR's general observation to a specific, quantified problem.

Non-tariff barriers (NTBs): Both reviews acknowledge that cumbersome customs procedures, lack of regulatory harmonisation and administrative inefficiencies act as significant hidden trade barriers that harm intra-SACU trade. The TLR points to these as constraints even in a tariff-free union (Safaeimanesh & Jenkins, 2021), and the SLR confirms that NTBs often impose higher costs than tariffs themselves (C-BRTA, 2022a; Ndzama, 2025). The SLR also refines and quantifies this understanding. It categorises NTBs into technical barriers (SPS measures), cumbersome procedures and poor implementation. It provides examples, such as the *cheeseburger problem*, where a single processed food product is subject to multiple, complex SPS forms because no single document accommodates its composite ingredients, making trade excessively complicated (Farole, 2016). and data from the C-BRTA (2022a) shows that customs processes alone can consume over 136 hours (77%) of a truck's northbound journey, costing a single operator over R116,106 annually in standing time.

Economic asymmetry and discouraging revenue sharing formula (RSF): Both reviews recognise South Africa's economic dominance and the structural imbalances perpetuated by the SACU revenue sharing formula (RSF). The TLR notes that the RSF creates fiscal dependency for BLNE countries and discourages industrial diversification (Abban, 2020; Ndzama, 2025). The SLR reinforces this, illustrating how the RSF locks smaller members into a cycle of dependency rather than promoting productive integration (Banga & Balchin, 2019; Ndzama, 2025). The SLR strengthens this argument by revealing the profound policy consequences. It synthesises findings that the RSF diminishes the urgency for BLNE governments to pursue industrial policy reforms and locks the union into an unsustainable model of fiscal dependency (Banga & Balchin, 2019;

Ndzama, 2025). It directly links this fiscal mechanism to the lack of supply capacity in BLNE countries, even in sectors where they hold a comparative advantage.

Need for integrated policy interventions: Both reviews conclude that isolated policy approaches are insufficient to solve the problems mentioned above. The TLR calls for coordinated investment in both hard and soft infrastructure (Tandrayen-Ragoobur *et al.*, 2022), whereas the SLR proposes a holistic, phased roadmap that combines infrastructure investment, trade facilitation and policy reform (Ketu & Wirajing, 2024; SACU, 2024) to address these challenges. The SLR's central finding is that the infrastructure challenges in SACU are deeply interconnected, crosscutting and mutually reinforcing. The implementation roadmap proposed in Chapter 4 (Table 13) is a direct response to this challenge by proposing a coherent, multi-stage strategy that combines digitalisation, regulatory harmonisation, infrastructure investment and political commitment.

In summary, both the TLR and SLR identified the same type of challenges that undermine the sustainability of intra-SACU trade.

Areas of discrepancy and new insights

Both the TLR and SLR consistently identify several discrepancies and new insights in terms of the sustainability of intra-SACU trade:

Interconnected and mutually reinforcing challenges: The SLR uniquely identifies a triad of deeply intertwined challenges, such as infrastructure deficits, NTBs and sustainability concerns that create a vicious cycle. For example, port congestion (infrastructure) worsens border delays (an NTB) (C-BRTA, 2022ab). Delays at borders caused by bureaucratic NTBs lead to trucks idling for hours, significantly increasing emissions and undermining environmental goals (Lalendle *et al.*, 2021; Harmon, 2015). The dominance of road freight (due to rail failure) generates 90% more GHG emissions than rail and makes the SACU highly vulnerable to carbon taxes like the EU's CBAM (Edwards *et al.*, 2024; Lalendle *et al.*, 2021). The cross-cutting figures (Figures 1, 2 and 3 in Chapter 4) visually model these negative feedback loops, a conceptual advancement that the traditional literature failed to point out.

Sustainability as a central threat: The SLR places greater emphasis on the environmental and long-term feasibility dimensions of sustainability. It highlights that

heavy reliance on road freight contributes significantly to greenhouse gas emissions and exposes SACU members to carbon border taxes (Edwards *et al.*, 2024; Lalendle *et al.*, 2021). It also raises alarms about ageing infrastructure, noting that 78% of South Africa's road network has exceeded its design life, posing a systemic collapse risk (Ross & Townshend, 2018). The SLR reveals that South Africa is the 14th most exposed country globally to the EU's Carbon Border Adjustment Mechanism (CBAM), posing a direct financial threat to its exports (Edwards *et al.*, 2024). The TLR touches on sustainability but does not dive into these specific, urgent threats.

Governance and institutional weaknesses: The SLR provides a more granular analysis of the governance deficits behind infrastructure and NTB challenges. It highlights fragmented authority, poor coordination, chronic underfunding, and lack of political will as root causes that persist even where physical infrastructure exists (Farole, 2016; Ketu & Wirajing, 2024). The TLR acknowledges institutional challenges, such as overlapping REC memberships and political nationalism (Simon, 2010), but does not explore them in much more operational detail. The SLR delves much deeper, identifying governance as the core systemic obstacle. A prime example offered by the SLR is the failure to implement the streamlined SACU operational structure, which remains stuck in a complex system of 18 committees (SACU, 2024). It argues that without good governance, even technical solutions are prone to fail (Ketu & Wirajing, 2024).

Action-oriented solutions: The SLR challenges the status quo by moving from vague directions to a specific, evidence-based, and phased implementation roadmap (Table 13). This is a significant contribution. It translates the identified problems into tangible solutions:

- Immediate (1-2 years) solutions, such as digitising trade processes and launching an NTB removal task team.
- Medium-term (3-5 yrs) solutions such as establishing an SME support facility and achieving regulatory harmonisation in one sector.
- Long-term (5+ yrs) solutions by developing sophisticated regional value chains, adopting a common currency and revising the RSF (SLR, Section 4.5.2).

The TLR's recommendations are more conceptual and less sequenced, and they conclude by providing general policy recommendations or directions only (e.g. invest in infrastructure, harmonise policies).

In summary, the SLR findings and recommendations identified specific challenges and solutions to intra-SACU trade, which the traditional literature review failed to address.

The following section deals with how the SLR strengthens, refines and/or challenges the TLR.

How the SLR strengthens, refines or challenges the TLR:

Strengthens and refines: The SLR strengthens the TLR's findings by providing robust empirical evidence from a systematic synthesis of 28 sources. It refines the TLR's broad assertions into more precise and actionable insights. For instance, the TLR's general claim that infrastructure is essential to intra-SACU trade is refined by the SLR's detailed analysis of how specific infrastructure failures, like energy instability at border posts, halt digital clearance systems and this, in turn, directly disrupts trade (C-BRTA, 2022; SACU, 2024).

Nuance and depth addition: The SLR adds nuance by revealing a difference in perspective between academic sources (which focus on root causes, such as flawed institutional design) and institutional reports (which provide practical insights into operational issues, like weighbridge delays), investigating the performance of intra-SACU trade. This view enriches the understanding of the challenges that SACU members face regarding intra-SACU trade, which goes beyond the TLR's more unified narrative.

Challenges or complements: The SLR does not fundamentally challenge the TLR's conclusions but rather complements and deepens them. It confirms the TLR's identified gaps, such as the overemphasis on economic indicators and the lack of integrated frameworks in SACU, and directly addresses them by offering a more holistic, system-wide analysis that incorporates economic, social and environmental dimensions of sustainability into the sustainability of intra-SACU trade debate.

In summary, the TLR in Chapter 2 effectively establishes the conceptual framework, key themes and broad challenges of intra-SACU trade. It correctly identifies the leading actors, the theoretical imbalances and the areas of concern. The SLR in Chapter 4, on the other hand, takes this foundation and transforms it into a dynamic, evidence-based model of the region's trade ecosystem. It reveals the complex, vicious cycles interconnecting infrastructure, policy and sustainability challenges and roots them in systemic governance failures. Most importantly, it moves from diagnosis to prescription,

offering a structured, phased roadmap for achieving a more resilient and sustainable intra-SACU trading system. Together, the two chapters provide a comprehensive and rigorous analysis, with the SLR serving as the crucial capstone that validates, deepens and operationalises the insights of the TLR.

5.5 The motive behind the selection of the SLR methodology

As mentioned in Chapter 1, the SLR approach was initially chosen because it enables a comprehensive, structured and objective synthesis, providing insights into existing knowledge gaps and a deeper understanding of the factors influencing the sustainability of intra-SACU trade. It also contributed to the study in the following ways:

Addressing data scarcity and fragmented evidence

As mentioned in Chapter One, the SACU region suffered from a lack of detailed, consistent and reliable data, particularly regarding infrastructure quality and its direct impact on trade flows, especially for smaller, landlocked members such as Lesotho and Eswatini (SACU, 2024). While a traditional literature review helped establish theoretical foundations (as outlined in the TLR overview), it risked being selective and narrative-driven, potentially overlooking critical but less accessible evidence. The SLR methodology was therefore adopted to overcome this limitation. As noted in Chapter 3 (Section 3.2), the SLR's structured, protocol-driven approach enabled the comprehensive gathering and synthesis of scattered evidence on infrastructure, trade dynamics, and sustainability from a wide range of sources. This allowed for the construction of a complete and more reliable picture in the absence of primary data (Tranfield *et al.*, 2003). In doing so, the SLR directly addressed the main criticism of traditional literature reviews—namely, that they often lacked thoroughness and were not conducted as genuine pieces of investigatory science (Tranfield *et al.*, 2003). Addressing these data constraints was, therefore, the SLR's most important contribution to the study.

Ensuring transparency, replicability, and reduced bias

One of the core strengths of the SLR methodology was its commitment to methodological transparency and replicability, which significantly reduced researcher bias—a common critique of traditional literature reviews (Tranfield *et al.*, 2003: 208; Snyder, 2019). This study adhered to a strict protocol that included clearly defined research questions, explicit inclusion and exclusion criteria, and a documented search strategy. In doing so, the

systematic review followed a replicable, scientific, and transparent process designed to minimise bias (Tranfield *et al.*, 2003: 209). The use of the PRISMA flow diagram further provided a clear audit trail, ensuring that the process was transparent and reproducible (Page *et al.*, 2021). This level of rigour was essential for producing credible findings, as SLRs created an audit trail of reviewer decisions, procedures, and conclusions (Tranfield *et al.*, 2003: 209). This made them a more reliable basis for policy than traditional reviews, which were often vulnerable to researcher bias (Tranfield *et al.*, 2003: 207–208). Addressing these research concerns was, therefore, the SLR's second most important contribution.

Systematically identifying patterns, gaps and interconnections

The complexity of intra-SACU trade necessitated a method capable of identifying both overarching patterns and nuanced interconnections. The SLR's thematic synthesis approach was instrumental in addressing these challenges by systematically categorising findings into key themes. Research synthesis has been defined as a collective term for a family of methods used to summarise, integrate, and, where possible, cumulate the findings of different studies on a given topic or research question (Mulrow, 1994, cited in Tranfield *et al.*, 2003: 217). This was demonstrated in Chapter 4, where the SLR revealed the extent to which various challenges were interlinked. Unlike a simple narrative review that did not attempt to seek generalisation or cumulative knowledge (Greenhalgh, 1997, cited in Tranfield *et al.*, 2003: 217), the SLR advanced towards a synthesis that aimed to generate a more profound understanding and foster conceptual and theoretical development (Tranfield *et al.*, 2003: 218). This methodological orientation represented another key contribution of the SLR.

Complementing the traditional literature review

The SLR did not replace the TLR but rather complemented it by building upon its foundational theories with a robust, empirical evidence base. The TLR effectively established the conceptual framework; however, the SLR addressed the identified gaps by providing a concrete, evidence-based analysis. This approach aligned with the argument for methodologies that enhance the legitimacy and authority of evidence, thereby equipping practitioners and policymakers with a more reliable basis for decision-making (Tranfield *et al.*, 2003: 208). Furthermore, the SLR's quality assessment strategy, which weighted high-quality academic sources alongside authoritative grey literature,

ensured that the synthesis captured both rigorous academic debates and vital, on-the-ground insights. In this way, the SLR sought to achieve the pragmatic balance between rigour and relevance (Tranfield *et al.*, 2003: 219). This complementarity substantially strengthened the overall literature review.

Informing actionable and evidence-based policy

The ultimate objective of this research was to inform actionable policy strategies and the SLR methodology was uniquely suited to generating such evidence-based recommendations. By systematically synthesising findings from diverse sources, the SLR enabled the development of a coherent, multi-stage implementation roadmap for this study. This output reflected the core aim of applying systematic review procedures to management research—namely, to increase the precision of a reliable evidence base so that policymakers and practitioners could make more informed and sensitive judgements (Tranfield *et al.*, 2003: 219). The resulting roadmap transformed the synthesised evidence into a form that was both accessible and usable in the real-world practice and policymaking (Tranfield *et al.*, 2003: 218).

The combined findings of the TLR and SLR highlighted the following priority areas for policy action, infrastructure investment, and regional integration strategies.

5.6 Implications for policy and regional trade integration

As mentioned before in this chapter, the sustainability of intra-SACU trade is critically undermined by a triad of deeply interconnected challenges: severe infrastructure deficits, pervasive NTBs and profound economic asymmetry. The combined findings from both the traditional literature review and the systematic analysis revealed that these issues threaten the region's financial resilience, competitive integration and equitable growth (Vilakazi, 2018; SACU, 2024; Ndzama, 2025). The heavy reliance on a deteriorating road-based logistics system, which carries over 70% of freight, is a primary concern (Lalendle *et al.*, 2021: 4). This system is plagued by inefficiencies such as the massive road maintenance backlog in South Africa, which is estimated at R75-R200 billion and the chronic port congestion at Durban, which forces trucks to idle for extended periods, burning fuel and increasing emissions (Department of Transport, 2023b:35 & 88; Tetley *et al.*, 2022:147; Ross & Townshend, 2018; Harmon, 2015). This not only increases costs

but also creates significant environmental risks, exposing SACU members to potential carbon taxes and undermining the long-term viability of regional trade.

Compounding these physical barriers is also the complex web of the non-tariff obstacles that stifle efficiency and increase transaction costs. Despite the standard external tariff, both the traditional literature and the SLR analyses highlighted that the movement of goods is hampered by cumbersome customs procedures, a lack of harmonised sanitary and phytosanitary (SPS) standards and regulatory fragmentation (Wajda-Lichy, 2014:148). A stark example is the *cheeseburger problem*, where a single processed food product is subject to multiple, complex SPS forms because no single document accommodates its composite ingredients (Farole, 2016). Furthermore, manual and paper-based processes dominate border posts with customs clearance alone consuming over 136 hours (77%) of a truck's northbound journey on some corridors, costing a single operator in SACU over R116,000 annually in standing time (SACU, 2024; C-BRTA, 2022). These NTBs act as a significant drag on competitiveness, particularly for SMEs and time-sensitive sectors such as perishable goods, hindering the development of robust regional value chains.

The sustainability challenge is further exacerbated by the stark economic asymmetry within the SACU, institutionalised by the RSF. South Africa accounts for approximately 97% of intra-SACU trade and 90% of its GDP, creating a core-periphery dynamic where the BLNE countries are heavily dependent on fiscal transfers rather than productive, trade-oriented capacity (Ndzama, 2025; Umezurike *et al.*, 2016; Harmon, 2015). The RSF, which contributes up to 40% of government revenue for BLNE states, creates a perverse disincentive for industrial development and diversification in these smaller economies (Abban, 2020). This dependency is compounded by infrastructure disparity; for instance, Eswatini relies on South Africa for 80% of its energy needs, meaning load-shedding in South Africa also immediately disrupts economic activity in Eswatini (Ndzama, 2025). This structure perpetuates inequality and undermines the collective potential of the union.

Evidence from the SLR revealed that this interplay between the challenges creates a vicious downward spiral, locking SACU into an unsustainable trade model. Infrastructure weaknesses amplify the costs imposed by NTBs, as poor road conditions and port bottlenecks intensify delays caused by bureaucratic procedures. Conversely, regulatory fragmentation and a lack of political will hinder the coordinated investment needed to

address infrastructure gaps (Simon, 2010; McCarthy, 2014). The resulting high trade costs and inefficiencies further erode competitiveness, discourage investment in value-added production and reinforce the very economic asymmetries that started the cycle. This systemic fragility is evident in South African ports, which are among the worst-performing globally, resulting in an estimated R150 billion in lost exports in 2022 alone. This failure impacts all landlocked members that depend on these gateways (Edwards *et al.*, 2024).

The SLR analysis also provided a synthesised overview of the key academic and policy literature, identifying the challenges and policy intervention opportunities needed for sustained trade-led development in SACU. Based on these findings, the study developed a coherent, multi-stage implementation roadmap for sustainable intra-SACU trade going forward.

The roadmap proposes the following: SACU's future policy actions must be immediate, coordinated and multifaceted. The highest priority is to accelerate trade facilitation through digitalisation and the removal of NTBs. This entails implementing digital single-window systems and OSBPs to streamline customs, alongside also establishing a dedicated task team to identify and eliminate specific regulatory bottlenecks, such as the inconsistent classification of foot-and-mouth disease zones, which cripple the regional beef trade (Farole, 2016). Concurrently, a critical policy intervention must be the reform of the RSF to incentivise productive investment and industrial development in BLNE countries, moving the union from a model of fiscal dependency to one of productive integration (Ndzama, 2025).

Strategic infrastructure investment is also necessary to complement these policy reforms. The first step must be emergency maintenance on key road and rail corridors to prevent further decay and preserve existing capacity. In the long term, investment must focus on building an integrated, multi-modal network that facilitates a shift from road to rail, alongside diversifying energy sources to mitigate the risks posed by South Africa's energy crisis (DBSA, 2024; Department of Transport, 2023b; Lalendle *et al.*, 2021). Investments should be targeted at projects with regional impact, such as improving the corridors linking Lesotho to South African ports or modernising the Port of Walvis Bay in Namibia to serve landlocked members better.

A deeper regional integration strategy must form the overarching framework for these actions. This requires strengthening both political will and the SACU's institutions to overcome nationalistic interests and ensure coordinated decision-making (Simon, 2010). Furthermore, the SACU must develop a cohesive strategy to strategically position itself within the AfCFTA, using the larger continental market to attract investment into regional infrastructure and value chains, rather than allowing member states to fragment and compete individually (Nare & Alhassan, 2024). The goal should be deep policy integration, moving towards harmonised standards, coordinated macroeconomic policies and potentially a common currency to reduce transaction costs.

The findings from the systematic review indicate that the sustainability of intra-SACU trade is precarious and cannot be secured by incremental measures. The challenges are deeply systemic and interconnected, requiring a dual strategy: simultaneous large-scale, coordinated investment in regional infrastructure and profound policy reform aimed at removing NTBs, reforming fiscal structures and fostering deeper political integration. Without this concerted and holistic effort, the union will remain trapped in a cycle of high costs, entrenched inequality and declining competitiveness, ultimately failing to harness its collective potential for resilient and sustainable growth. The roadmap presented, from immediate digitalisation to long-term structural reform, provides a clear, evidence-based pathway to avoid this outcome.

5.7 Relating SLR findings back to research questions and theory

This section synthesises the evidence from the SLR to provide direct answers to the study's research questions and to evaluate the extent to which the stated research objectives were achieved.

Answering the Primary Research Question

- **How do existing infrastructure challenges affect the sustainability of intra-SACU trade?**
 - The SLR reveals that existing infrastructure challenges critically undermine the sustainability of intra-SACU trade across all three dimensions of the triple-bottom-line framework:
 - **Economic Resilience:** Poor and deteriorating road, rail, and port infrastructure directly increases logistics costs, causes unpredictable delays, and reduces supply chain reliability. This erodes the cost-competitiveness of intra-regional trade and makes member states vulnerable to external shocks (Sections 4.3.1, 5.3).
 - **Social Inclusivity:** Severe infrastructure disparities, particularly between South Africa and the BLNE countries, perpetuate a core-periphery dynamic. Landlocked members face disproportionately higher trade costs and barriers, limiting their firms' access to regional markets and entrenching economic dependency rather than fostering equitable benefits (Sections 4.3.3, 5.3).
 - **Environmental Feasibility:** The dominance of road freight, a consequence of rail infrastructure failure, results in significantly higher greenhouse gas emissions. This not only contributes to environmental degradation but also exposes SACU exports, particularly from South Africa, to risks from mechanisms like the EU's Carbon Border Adjustment Mechanism (CBAM), threatening future market access (Sections 4.3.3, 4.4).

In essence, infrastructure deficits act as a binding constraint, creating a vicious cycle where high costs, entrenched inequality, and environmental vulnerabilities collectively threaten the long-term viability of intra-SACU trade flows.

Answering the Secondary Research Questions

1. What are the key infrastructure challenges currently faced by SACU member countries?

The key challenges are systemic and interlinked:

- **Physical (Hard) Infrastructure Deficits:** This includes a massive road maintenance backlog (estimated at R75–R200 billion in South Africa), chronic port congestion, dilapidated rail networks, and unreliable energy supplies which disrupt production and border operations (Sections 4.3.1).
 - **Institutional and Regulatory (Soft) Infrastructure Failures:** Challenges encompass cumbersome and non-harmonized customs procedures, complex Sanitary and Phytosanitary (SPS) measures, a lack of digital interoperability, fragmented governance, and inconsistent policy implementation across borders (Sections 4.3.2, 4.3.4).
 - **Cross-Cutting Issues:** These deficits are exacerbated by security concerns (e.g., truck hijackings), funding shortages, and a lack of coordinated regional planning (Section 4.3.1).
2. How does infrastructure quality vary among SACU member countries and compare to regional and global benchmarks?

Infrastructure quality is highly uneven within SACU and lags behind global standards:

- **Intra-SACU Variation:** South Africa and Namibia have the highest quality road networks, though South Africa's is rapidly deteriorating. Botswana has relatively good main corridors, while Lesotho and Eswatini face significant challenges due to terrain and underinvestment (Section 1.1.3).
- **Regional Benchmarking (vs. EAC):** SACU as a bloc generally outperforms the East African Community (EAC) in indices like the Logistics Performance Index (LPI) and Road Quality Index (RQI), largely due to South Africa's advanced but aging infrastructure (Sections 2.8.4, 2.8.5, 2.8.6).
- **Global Benchmarking:** Despite this regional advantage, all SACU members except South Africa score below the global median on key infrastructure indices. Even South Africa's scores have declined, highlighting a persistent competitiveness gap with global peers (Sections 2.8.4, 2.8.6).

3. How do road infrastructure deficiencies in SACU impact trade flows between member countries?
 - Given that road freight dominates intra-SACU trade, deficiencies have a direct and severe impact:
 - Increased Costs and Delays: Poor road conditions, congestion, and border bottlenecks increase vehicle operating costs, fuel consumption, and transit times. For example, border delays alone can add over R116,000 annually in standing costs per operator (Sections 1.1.4, 4.3.2).
 - Reduced Reliability and Volume: Unpredictable travel times and road closures disrupt just-in-time supply chains, forcing businesses to hold higher inventory. This unreliability discourages trade and investment, ultimately suppressing trade volumes (Sections 4.3.1, 4.4).
 - Modal Imbalance: The failure of rail infrastructure forces over-reliance onto roads, accelerating their deterioration and creating a negative feedback loop that further undermines the primary trade artery (Section 4.3.1).
4. What roles do government policies and regional agreements play in addressing infrastructure challenges within SACU?

Policies and agreements are critical but have been hindered by implementation gaps:

- Regional Agreements: Frameworks like the SADC Protocol on Transport and the AfCFTA provide a vision for harmonization and infrastructure development. SACU's own trade facilitation pillar aims to reduce non-tariff barriers and modernize borders (Sections 1.1.5, 2.4).
- National Policies: Countries have individual strategies (e.g., Botswana's National Transport Policy, Namibia's Transport Infrastructure Improvement Project) and South Africa's National Infrastructure Plan 2050, which target specific corridor upgrades and logistics improvements (Section 1.1.5).
- Critical Shortcomings: The study finds a significant disconnect between policy ambitions and on-the-ground realities. Implementation is hampered by a lack of political will, fragmented institutional coordination, chronic underfunding, and the disincentives embedded in the SACU Revenue Sharing Formula (RSF), which reduces the urgency for BLNE states to invest in trade-enabling infrastructure (Sections 4.3.4, 5.3).

Achievement of Research Objectives

The study successfully achieved its primary and secondary research objectives:

- **Primary Objective Achieved:** The impact of infrastructure challenges on trade sustainability was comprehensively analysed. The SLR provided robust evidence that these challenges degrade economic resilience, hinder social inclusivity, and compromise environmental feasibility, thereby threatening long-term viability.

Secondary Objectives Achieved:

1. **Key challenges were identified and categorized:** The SLR systematically cataloged hard and soft infrastructure deficits across all SACU members (Sections 4.2.1, 4.3.1, 4.3.2).
2. **Infrastructure quality was compared and benchmarked:** Using indices (GCI, LPI, RQI), the study documented intra-regional disparities and confirmed SACU's position below global standards (Sections 2.8.4–2.8.6).
3. **The impact on trade flows was evaluated:** The analysis conclusively linked road infrastructure deficiencies to increased costs, delays, and reduced trade volumes (Sections 4.3.1, 4.4).
4. **The role of policies was examined:** The study critically assessed the design and, more importantly, the implementation failures of existing policies and agreements, highlighting the gap between intent and outcome (Sections 4.3.4, 4.5.1).

In conclusion, the research objectives were fully met. The synthesis of TLR and SLR findings not only diagnosed the profound and interconnected infrastructure challenges but also provided the evidentiary foundation for the actionable, phased policy roadmap presented in Chapter 4, thereby delivering both academic insight and practical value for policymakers. The SLR's empirical evidence fundamentally challenges theoretical assumptions. It contradicts the Heckscher-Ohlin model by showing that infrastructure deficits prevent BLNE countries from leveraging their factor endowments (Farole, 2016). It supports but also exposes a key limitation of New Trade Theory, as South Africa's economies of scale are amplified without automatically uplifting smaller members due to the fragmented regional network (Grobelaar & Meyer, 2017). Most critically, it reveals a crippling policy-implementation gap (RQ4/5). While regional agreements, such as the SACU Agreement, exist, their potential is undermined by governance bottlenecks and a

lack of political will and consensus, leaving the institutional theory's emphasis on effective institutions unfulfilled (Simon, 2010; Safaeimanesh & Jenkins, 2021).

The SLR's core contribution is the empirical finding that inefficient infrastructure is not a peripheral issue but the central distorting force in SACU (Malefane & Odhiambo, 2017; Edwards *et al.*, 2024). It actively undermines all three pillars of sustainability by distorting comparative advantages, concentrating economic benefits and creating environmental inefficiencies (Lalendle *et al.*, 2021). This diagnosis provides the essential evidentiary foundation that explains the union's trade sustainability crisis, moving the discussion from theoretical expectations to the tangible barriers that must be addressed through coordinated, evidence-based policy (McCarthy, 2014; SACU, 2024).

5.8 Summary and contribution

This chapter has served as the pivotal synthesis of the entire dissertation, weaving together the foundational theories from the traditional literature review (TLR) with the hard, empirical evidence uncovered by the systematic literature review (SLR). The analysis conclusively reveals that the sustainability challenges hampering intra-SACU trade is not related to one single issue but rather a complex web of three deeply intertwined problems: crumbling infrastructure, cumbersome administrative red tape known as non-tariff barriers (NTBs), and a fundamental economic imbalance where South Africa's economy vastly overshadows those of its partners (Botswana, Lesotho, Namibia and Eswatini). These issues feed into each other, creating a vicious downward spiral that stifles growth and competitiveness (SACU, 2024; Ndzama, 2025).

The value of employing the Systematic Literature Review methodology became clear in this process. While the TLR excelled at establishing the economic theories and broad themes, the SLR provided a transparent, rigorous, and evidence-based deep dive into the real-world situation. It moved the discussion from general observations like infrastructure is a problem to specific, quantified realities. For instance, it highlighted that customs delays can waste over 136 hours of a truck driver's time on a single trip and that South Africa faces a road maintenance backlog costing up to R200 billion, facts that bring the scale of the problem into sharp focus (Department of Transport, 2023b; Tetley *et al.*, 2022; C-BRTA, 2022). This systematic approach was crucial for building a reliable evidence base where primary data is scarce.

A key insight from this synthesis is how these challenges are not isolated but are deeply interconnected, each making the others worse. For example, a poorly maintained road (infrastructure deficit) causes a truck to be delayed further at a congested border post where paperwork is processed manually (an NTB). This idling truck burns fuel needlessly, increasing greenhouse gas emissions and making SACU exports vulnerable to international carbon taxes and becoming an environmental and economic sustainability risk (Lalendle *et al.*, 2021; Edwards *et al.*, 2024). Furthermore, the revenue-sharing formula (RSF), which provides vital funds to smaller members, inadvertently discourages them from developing their own industries, locking them into a cycle of dependency on South Africa and perpetuating the very asymmetry that impedes true integration (Abban, 2020; Banga & Balchin, 2019).

These findings directly form the bedrock of the phased implementation roadmap that this study presents as the most important solution to ensure sustainable intra-SACU trade in future. The roadmap is not made up of a separate list of ideas but rather a direct, logical response to the evidence. The immediate call to digitise trade processes and launch an NTB task force tackles the most solvable administrative hurdles. The medium-term goals of supporting small businesses and harmonising regulations aim to level the economic playing field. Finally, the long-term vision of building regional factories and revising the revenue-sharing formula attacks the root causes of economic asymmetry, aiming to transform the SACU from a group of unequal partners into a truly integrated, competitive bloc (Ketu & Wirajing, 2024; Ndzama, 2025).

In doing so, this chapter successfully bridges the gap between academic analysis and practical policy, fulfilling a core objective of this dissertation. It takes abstract concepts and theoretical risks and translates them into a clear, actionable strategy for policymakers. The roadmap provides a coherent sequence of steps, acknowledging that while some solutions can be implemented quickly, others require long-term political commitment and investment. It argues convincingly that tackling these issues in isolation will fail; only a coordinated, holistic approach that addresses infrastructure, policy and economic structures simultaneously can break the vicious cycle (Tandrayen-Ragoobur *et al.*, 2022).

This chapter weaved together the foundational theories from the TLR with the empirical evidence uncovered through the SLR. The analysis demonstrates that the sustainability challenges hampering intra-SACU trade are not the result of a single factor, but rather a

complex interplay of three deeply intertwined problems: deteriorating infrastructure, cumbersome administrative procedures (NTBs) and a fundamental economic imbalance in which South Africa's economy vastly overshadows those of its partners—Botswana, Lesotho, Namibia and Eswatini. These issues reinforce one another, creating a vicious cycle that stifles growth and undermines competitiveness (SACU, 2024; Ndzama, 2025).

The value of employing the SLR methodology became particularly evident in this process. While the TLR effectively established the theoretical framework and broad themes, the SLR provided a transparent, rigorous and evidence-based examination of the real-world situation. It moved the discussion from general observations, such as “infrastructure is a problem”, to specific, quantifiable realities. For instance, it highlighted the fact that customs delays can waste over 136 hours of a truck driver's time on a single trip and that despite South Africa having a high IMF speed score the country faces a road maintenance backlog of up to R200 billion—facts that underscore the magnitude of the challenge (Department of Transport, 2023b; Tetley *et al.*, 2022; C-BRTA, 2022a). This systematic approach was crucial for building a reliable evidence base where primary data is scarce.

A key insight from this synthesis is that these challenges are not isolated; each exacerbates the others. For example, a poorly maintained road (infrastructure deficit) delays trucks further at congested border posts where paperwork is processed manually (an NTB). This idling increases fuel consumption, greenhouse gas emissions and the vulnerability of SACU exports to international carbon taxes, creating both environmental and economic risks (Lalendle *et al.*, 2021; Edwards *et al.*, 2024). Furthermore, the RSF, which provides critical funds to smaller members, inadvertently discourages them from developing their own industries, reinforcing dependency on South Africa and perpetuating economic asymmetry (Abban, 2020; Banga & Balchin, 2019).

These findings directly informed the phased implementation roadmap presented in this study as the most important solution to ensuring sustainable intra-SACU trade. The roadmap is not a separate set of ideas but a logical response to the evidence. Immediate actions, such as digitising trade processes and launching an NTB task force, address the most solvable administrative hurdles. Medium-term measures, including support for small businesses and regulatory harmonisation, aim to level the economic playing field. Finally, long-term initiatives, such as establishing regional factories and revising the RSF, tackle the root causes of economic asymmetry, aiming to transform the SACU from a group of

unequal partners into a truly integrated and competitive bloc (Ketu & Wirajing, 2024; Ndzama, 2025).

By meshing together academic analysis and practical policy, this chapter achieves a core objective of the dissertation. It translates abstract concepts and theoretical insights into a clear, actionable strategy for policymakers. The roadmap provides a coherent sequence of steps, recognising that some solutions can be implemented quickly, while others require sustained political commitment and investment. It underscores that addressing these issues in isolation is insufficient; only a coordinated, holistic approach that simultaneously tackles infrastructure, policy, and economic structures can break the vicious cycle (Tandrayen-Ragoobur et al., 2022).

This detailed roadmap (see Chapter 4) represents the single most important contribution of the study.

In conclusion, the sustainability of intra-SACU trade stands at a crossroads. Incremental, uncoordinated national policies risk higher costs, greater inequality and declining competitiveness. In contrast, the evidence-based roadmap charts a path for bold, collective action to improve infrastructure, streamline administrative processes and foster a more equitable union. By providing a comprehensive diagnosis and a practical prescription, this study establishes the evidentiary foundation for the dissertation's final conclusions and recommendations, demonstrating that a resilient and sustainable future for intra-SACU trade is achievable—but only through focused, sustained, and coordinated effort.

5.9 Limitations of the study

This research, while providing a comprehensive SLR on infrastructure and trade sustainability in SACU, is subject to several implicit methodological and contextual limitations that must be acknowledged. These constraints come from the SLR process itself, the nature of the available literature and the unique dynamics of the SACU region, as illuminated by sources like the SACU Integrated Annual Report (SACU, 2024).

A primary methodological limitation arises from the built-in selectivity of the SLR process. Despite applying rigorous inclusion and exclusion criteria that prioritised peer-reviewed articles and institutional reports, this approach probably excluded valuable insights from non-traditional sources such as grey literature, unpublished theses or highly localized

case studies. This is particularly relevant in the SACU context, where critical operational data such as the detailed findings from trade data audits and reconciliation processes mentioned in the SACU Report (2024: 95) reside in internal technical documents not commonly found in academic databases, thus potentially omitting accurate perspectives on trade dynamics.

Furthermore, the quality and consistency of the analysed literature varied significantly, presenting a challenge for robust synthesis. Many studies have relied on descriptive or theoretical analyses rather than empirical data, making it difficult to precisely quantify the economic impact of infrastructure deficits. This issue is compounded by the data landscape within the SACU itself. While the SACU in Figures Report (SACU, 2025) provides aggregate metrics, it explicitly aggregates data from five distinct national statistical bodies, highlighting the challenge of achieving perfect comparability across member states. Consequently, the fickleness in underlying data collection methodologies across Botswana, Eswatini, Lesotho, Namibia and South Africa makes definitive, region-wide conclusions challenging to establish.

Another significant and recurring practical limitation was the pronounced geographic and thematic bias that was included in the available literature. As evidenced by the vast economic disparities detailed in SACU (SACU, 2024) where South Africa's GDP in 2023 (R7.02 trillion) dwarfs that of Eswatini (R81.98 billion) and Lesotho (R39.07 billion). The research disproportionately focuses on South Africa. This bias risk frames the challenges of smaller, landlocked member states through a South African-centric lens, neglecting unique local constraints and limiting the generalisability of findings and policy recommendations across the entire SACU bloc.

Additionally, the rapidly evolving policy and infrastructure landscape in Southern Africa poses a temporal challenge. A visible gap exists in post-pandemic research and many included studies predate 2020. Consequently, influential recent developments such as the full implementation of the AfCFTA, detailed in the SACU Report (2024: 92–94) as an ongoing process of negotiations and workshops are not yet fully reflected in academic literature. This means the review may not capture the most recent realities of this dynamic policy environment even though it details the significant influence of this policy measure towards ensuring sustainable development and intra-SACU trade.

The study's reliance on secondary data also means it cannot directly incorporate the firsthand experiences of key stakeholders. The actual perspectives of freight operators, small-scale traders and border communities whose daily operations are directly impacted by the infrastructure challenges and intra-SACU trade flows are quantified in official reports. While the SACU Secretariat engages with these groups, such insights are often summarised at a high strategic level, lacking the qualitative depth needed to understand operational bottlenecks and social impacts fully.

The focused scope on infrastructure and trade sustainability, while necessary, inevitably comes at the expense of other critical dimensions. Political economic factors, such as the power dynamics within the SACU, as hinted at by challenges in convening Ministerial Retreats (SACU, 2024:13), are discussed but not thoroughly analysed. Similarly, environmental and social sustainability considerations, though introduced, are not exhaustively treated; the SACU Report (2024: 105) only briefly mentions natural capital, reflecting a broader gap in research on green industrial policies within the union.

Finally, the exclusion of non-English literature may have limited the diversity of perspectives included in the review, particularly from Portuguese or French-speaking regional bodies that interact with SACU member states. This language bias, though common in SLRs, remains a relevant constraint in the African research context. While this study establishes a robust foundation for understanding infrastructure-related challenges to intra-SACU trade, these limitations are highlighted and exacerbated by the data disparities and aggregation challenges evident in SACU's own reporting and underscore the need for future empirical, mixed-methods research that incorporates broader stakeholder voices and more recent data to enrich the evidence base for effective policy formulation.

5.10 Possible areas for future research

While this study did not undertake a comparative analysis, future research could draw valuable lessons for SACU from other regions. For example, Rwanda's successful implementation of One-Stop Border Posts (OSBPs) demonstrated how coordinated border management can reduce transit times and trade costs. Vincent and Njong (2021) found that OSBPs led to a 73% reduction in border-crossing times for trucks and improved formal trade through streamlined processes and joint inspections. Similarly, efficient port operations in Mozambique and digital trade systems such as Singapore's TradeNet

provide models for reducing administrative bottlenecks and enhancing logistical efficiency. These examples highlight the potential benefits of integrating hard infrastructure improvements with soft infrastructure reforms—such as digital single windows and harmonised customs procedures—to facilitate seamless trade activities (Safaeimanesh & Jenkins, 2021; Edwards *et al.*, 2024).

Future research could also explore how the SACU might adopt a dual strategy of infrastructural investment and institutional cooperation. Drawing from the Rwandan OSBP model, studies could examine the feasibility of rolling out integrated border posts and digital trade facilitation systems across SACU to reduce delays and transaction costs. Further investigation is needed into the political will and resource commitments required for implementation, areas where SACU has historically struggled (Simon, 2010; SACU, 2024). In addition, aligning such efforts with continental frameworks like the AfCFTA could attract investment and strengthen regional value chains.

Beyond comparative lessons, several other research avenues emerge directly from this study's findings. Firstly, further studies could investigate the environmental dimension of trade inefficiencies, particularly how infrastructure deficits and border delays contribute to higher emissions and vulnerability to carbon border adjustment mechanisms. Secondly, future work could evaluate the effectiveness of SACU's phased policy roadmap (once implemented), providing empirical evidence on whether digitisation, NTB task forces, or revenue-sharing reforms achieve their intended impact. Thirdly, research could examine the distributional impacts of policy reforms, assessing how small and landlocked members—Lesotho, Eswatini and Botswana—might benefit differently from regional integration initiatives as compared to South Africa.

Finally, more work is needed to explore the **political economy of SACU reform**, particularly the ways in which domestic politics, sovereignty concerns, and power asymmetries shape cooperation or resistance to deeper integration. South Africa's economic dominance, combined with the dependence of smaller members on the RSF, creates both incentives and disincentives for reform. For instance, while smaller states rely heavily on SACU transfers for fiscal stability, they may resist reforms that threaten these inflows, even if such reforms could promote long-term competitiveness. Conversely, South Africa, which contributes most to the pool, may push for changes that smaller members might perceive as threatening their economic security.

Future research could investigate how these dynamics influence negotiation outcomes, policy adoption, and implementation within SACU. Case studies of past reform attempts—such as debates over the RSF or customs modernisation—could shed light on the institutional and political barriers to change. Comparative studies with other regional blocs (e.g., the East African Community or ECOWAS) could also provide insights into how asymmetries are managed elsewhere. Such research would help explain why the SACU has often struggled to move beyond a customs union toward deeper forms of integration and could identify potential pathways to overcome entrenched resistance.

Ultimately, these areas represent opportunities for future investigation to advance a more resilient, inclusive and sustainable trade environment within the SACU—one that benefits all member states, not only South Africa. Without such coordinated action, the full potential of intra-SACU trade is unlikely to be realised.

Conclusion

Chapter one of this study introduced the research proposal, *Analysing the Sustainability of Intra-SACU Trade in the Context of Existing Infrastructure Challenges*, providing the background, scope and foundation for the study. It presented the SACU and its trade dynamics, emphasising South Africa's dominance and the economic interdependence of member states. The chapter highlighted the critical role of road freight, particularly for landlocked members, and examined the state of road infrastructure across SACU, noting disparities between countries and their impact on cross-border trade efficiency. It identified key challenges, including delays, costs, crime and policy coordination issues and justified the use of a systematic literature review to address data limitations and the complex nature of trade sustainability. Finally, it articulated the problem statement, research questions and objectives, the significance of the study, ethical considerations and the chapter outline, setting the stage for a focused and rigorous investigation. Chapter two included a traditional literature review which covered the main themes in this study.

Chapter two also provided a traditional literature review that established the theoretical and empirical foundations for understanding intra-SACU trade. It reviewed trade theories, the benefits and limitations of trade openness, and the concept of regional integration, highlighting the critical role of both hard and soft infrastructure. The chapter also assessed SACU's infrastructure performance using global benchmarks and identified key research

gaps, including the limited focus on the direct impact on trade of infrastructure, the disconnect between policy and practical realities and the lack of standardized assessment frameworks. By synthesizing these insights, the chapter justified the study's focus on infrastructure and set the stage for the subsequent systematic literature review designed to rigorously address these gaps.

Chapter three outlined the research design and methodology, justifying the use of a qualitative Systematic Literature Review (SLR) to synthesize multi-disciplinary evidence ranging from 2010–2025. It described a transparent, multi-stage process using strict inclusion criteria, the PRISMA flow diagram, and a thematic synthesis of 28 selected studies, combining high-quality academic sources with authoritative grey literature. The chapter ensured that the research would be rigorous, replicable and policy-relevant, providing a trustworthy foundation for the study's findings.

Chapter four presented, synthesized and critically assessed the findings from the systematic literature review (SLR), providing the empirical core of the study. The systematic literature review confirms that the Southern African Customs Union (being the world's oldest customs union), faces significant and interconnected obstacles that threaten the long-term viability of its internal trade. The findings reveal that deteriorating and under-developed infrastructure, particularly in road transport, ports and energy acts as a primary barrier, increasing logistics costs, causing delays and reducing the region's competitiveness. These infrastructural deficits are compounded by pervasive non-tariff barriers, such as cumbersome customs procedures, regulatory fragmentation and a lack of policy harmonisation, which further stifle trade efficiency and regional integration.

Moreover, the chapter highlights the fact that the sustainability of intra-SACU trade is not solely an economic issue but also involves social and environmental dimensions. The heavy reliance on road freight contributes significantly to carbon emissions, while structural economic asymmetries, especially South Africa's dominance, exacerbate regional inequalities. The SACU RSF, though fiscally supportive to smaller members, inadvertently discourages industrial diversification and reinforces dependency rather than promoting sustainable, value-added trade.

In response to these challenges, the study proposes a multi-faceted and phased implementation roadmap. Immediate actions (1–2 years) should focus on operational improvements such as establishing one-stop border posts, digitising customs systems

and initiating critical maintenance on key trade corridors. Medium-term measures (3–5 years) must involve deeper regional policy coordination, investment in hard infrastructure like road and rail upgrades and better alignment with the African Continental Free Trade Area (AfCFTA). Long-term strategies (5+ years) should aim at fundamental reforms, including a revision of the revenue-sharing formula to incentivise production, the adoption of green logistics solutions and the development of regionally integrated value chains.

The success of these recommendations hinges on strong political will, coordinated policy implementation and significant investment both public and private. It is also clear that isolated interventions will be insufficient; an integrated approach addressing infrastructure, policy and sustainability simultaneously is essential to break the cycle of inefficiency and inequity.

This research contributes to the existing body of knowledge by providing a holistic and evidence-based analysis of how infrastructure has an impact on trade sustainability within the SACU. It bridges gaps between trade theory, logistics performance and policy reality, offering actionable insights for policymakers, regional institutions and private sector stakeholders. The systematic review methodology ensured a comprehensive synthesis of diverse sources, yielding credible and context-aware recommendations.

Chapter five served as the synthesising core of the study, integrating the theoretical insights from the Traditional Literature Review (TLR) with the empirical findings from the Systematic Literature Review (SLR). It highlighted how infrastructure deficits, non-tariff barriers and structural economic asymmetries interact to undermine intra-SACU trade, transforming general observations into specific actionable problems. The chapter's key contribution is its validation of the SLR methodology and its role in underpinning the phased implementation roadmap, providing policymakers with evidence-based guidance. By contextualising findings, acknowledging limitations, and outlining directions for future research, Chapter five establishes the foundation for the dissertation's final conclusions and practical recommendations.

In conclusion, intra-SACU trade possesses significant potential to drive regional growth, development, and resilience. However, realizing this potential requires urgent and concerted action to address the infrastructure and regulatory barriers identified. By adopting the proposed strategies, the SACU can transform its trade environment into a more efficient and competitive one that is not only inclusive and sustainable – thus

ensuring that all member states benefit equitably from more fundamental regional integration.

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