Chapter Two

The State and Implications of Transport Infrastructure on Regional Integration and Economic Development in the SADC Region: A Review Study

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Abstract

This chapter examines the impact of transport infrastructure on regional integration and sustainable economic development in the Southern African Development Community (SADC) region. Transport infrastructure refers to the physical structures, facilities, and networks that enable the movement of people, goods, and services from one location to another. It includes various modes of transportation such as roads, railways, airports, seaports, canals, pipelines, and associated facilities such as depots, terminals, and stations. The quality and extent

of transport infrastructure have significant implications for economic development and regional integration as it facilitates trade, commerce, and social interaction. The SADC region has undergone significant changes in transport infrastructure over the past decades, resulting in regional integration projects promoting economic development through improved connectivity. However, the SADC region faces several challenges regarding transport infrastructure, which can hinder regional integration and economic development. The challenges include poor road conditions, inadequate funding, inefficient border crossings, limited use of technology, limited capacity, climate change-induced damages, and political instability. The chapter concludes that investment in transport infrastructure has significant potential to enhance regional integration and promote economic development in the SADC region. The chapter recommends that policymakers prioritise investment in key transport infrastructure projects to promote such integration and economic development. Additionally, the chapter highlights the need for policy coordination and cooperation among member states in the SADC region to maximise the benefits of transport infrastructure investment.

Introduction

Globally, transport infrastructure has long been recognised as a critical component of economic growth and regional integration in many developing regions (Garcıa-Milà & McGuire, 1993; Cantos *et al*., 2005; Golub, 2014). Transport infrastructure refers to the physical components and facilities necessary for moving goods, people, and services from one place to another (Wood, 2015). It includes constructing, maintaining, and operating roads, railways, airports, seaports, and other transportation networks and systems (Golub, 2014). Transport infrastructure promotes economic development and regional integration by providing a platform for the efficient movement of goods, services, and people (Ndukwe, 2004; World Bank, 2023). Improved transport infrastructure leads to reduced transport costs, increased trade and investment, and improved market access, ultimately boosting economic activity (Guzman & Oviedo,

2018; Ibraeva *et al.*, 2020). Additionally, it promotes regional integration by creating links between regions, enhancing cultural exchange, and supporting regional cooperation (Ndukwe, 2004). Scholars, for example, Hrelja, 2015; Kalaoane, Matamanda & Bhanye, 2024 and Rondinelli, 2019, have argued that urban planners play a critical role in creating change, addressing change, planning, development, urban design and land use planning. To ensure accessibility, movability, and connectivity of urban areas and regions, urban planners and municipalities must pay attention to transportation planning (Hussin *et al.*, 2021).

In the Southern African Development Community (SADC), policymakers and stakeholders have focussed on the development of transport infrastructure to improve regional connectivity and promote economic development (Dominguez-Torres & Foster, 2011; Msemburi & Liza, 2014; Mlambo, 2020). However, significant challenges remain despite significant investments in transport infrastructure in regions such as the SADC (Crescenzi *et al.*, 2016; Msemburi & Liza, 2014).

This chapter examines the current state of transport infrastructure and its implications for regional integration and economic development in the SADC. Specifically, it explores the linkages between transport infrastructure development, regional integration, and economic development. Moreover, the existing challenges and opportunities for enhancing transport infrastructure in the region are also examined. The chapter draws on a range of theoretical and empirical literature on transport infrastructure, regional integration, and economic development to achieve these objectives. Case studies from countries in the SADC are analysed, highlighting successes and failures in transport infrastructure and their impact on regional integration and economic development. The chapter provides valuable insights for policymakers, academics, and other stakeholders interested in enhancing transport infrastructure and promoting regional integration and economic development in the SADC. Moreover, the chapter contributes to the broader literature on the role of transport infrastructure in promoting

economic growth and regional integration in developing countries.

Transport Infrastructure, Regional Integration and Sustainable Economic Development

Transport infrastructure refers to the physical facilities, structures, and systems designed to support the movement of people, goods, and vehicles between different locations (Chen, Dong, Zhu, Huang & Burdette, 2019). This includes roads, highways, bridges, tunnels, airports, seaports, railways, public transportation systems, and other facilities. Transport infrastructure is essential for the economic development of a region, for it enables the movement of goods and people from one place to another (Miller *et al.*, 2016; Wood, 2015). Effective transport systems contribute to the equitable distribution of resources and services in cities by providing access to jobs, education, healthcare, and recreation for all residents. This can help reduce spatial inequalities and promote social cohesion, creating more inclusive and sustainable cities. Effective transportation systems can reduce dependence on private cars, which can benefit local economies by reducing congestion and promoting economic vitality in urban centres (Kumar & Barrett, 2008; Mbara *et al.*, 2014). In this way, transportation infrastructure contributes to trade and commerce between regions (Guzman & Oviedo, 2018). The quality and availability of transport infrastructure can significantly impact a region's competitiveness, productivity, and economic growth (Ingvardson & Nielsen, 2018). Therefore, investing in the development and maintenance of transport infrastructure is critical for the long-term prosperity of a region or a country.

Regional integration is a process by which neighbouring countries come together to form closer economic, political, and social ties to achieve common goals (CEPAL, 2014; Gammadigbe, 2021). This can take many forms, such as a free trade agreement, customs union, common market, or political union (Schneider, 2017). Regional integration aims to promote economic growth, improve the standard of living of the member countries,

increase trade and investment, and facilitate cooperation and coordination in areas such as security, transportation, and energy. By working together, member countries can pool their resources, share knowledge and expertise, and create a larger market, which is more attractive to foreign investors (Gammadigbe, 2021; CEPAL, 2014). Examples of regional integration organisations include the European Union (EU), the African Union (AU), the Association of Southeast Asian Nations (ASEAN), and the SADC. The SADC is one of eight regional economic communities which form the building blocks of the AU (Fagbayibo, 2013). The African regional economic integration is supported by the South African Department of Trade, Industry and Competition (DTIC), focusing on the objectives and strategies set out by the AU and the New Partnership for Africa's Development (NEPAD) (Fagbayibo, 2013). The DTIC focuses on the SADC to ensure clear trade integration within Africa. This is essential for open regional markets and development (CEPAL, 2014; Department of Trade, Industry and Competition, 2023).

The World Commission on Environment and Development (WCED) emphasised the need for alternative development strategies in 1987. Through the Brundtland Report, the WCED defined sustainable development as development and economic growth that meets the needs of the present generation without compromising future generations (WCED, 1987; Tomislav, 2018). Sustainable development ensures that everyone's needs are met, particularly in poor communities across the world (Mensah, 2019). Most economies and developments, such as the building blocks of the AU, strive to maintain the sustainable development spheres, namely economic prosperity, social responsibility and environmental stewardship (Elliot, 2012; Hák *et al.*, 2016). See Figure 2.1.

To achieve sustainable development, these three spheres – economic prosperity, social responsibility and environmental stewardship, need to be balanced (Hák *et al.*, 2016). All spheres are equally important since they influence one another and have an effect on the overall sustainable development of an area (Elliot, 2012). A different way of presenting the spheres is indicated in Figure 2.2. This represents the environment in the

outer circle that provides to society and drives the economy. With this in mind, it is clear that the economy needs society and the environment to strive and expand (Hermwille, 2017). Therefore, to achieve sustainable economic development, it is important to balance economic growth and environmental protection (Mensah, 2019).

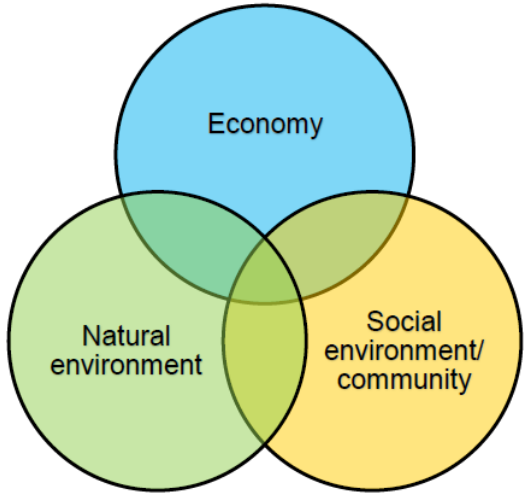

Figure 2.1: Sustainable Development Spheres. Source: Elliot, 2012

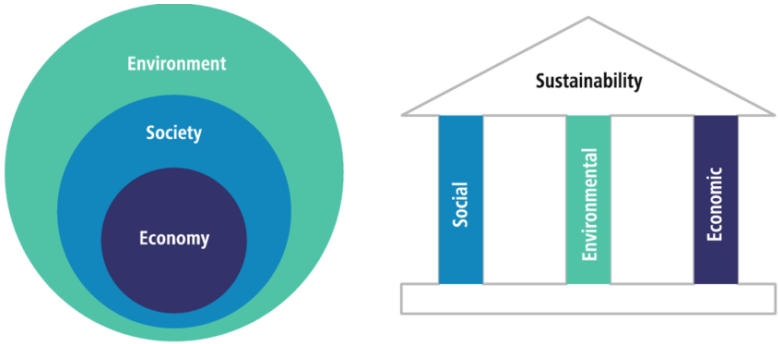

Figure 2.2: Dependency of the Economic Sphere on the Social and Environmental Sphere. Source: Göpel, 2016:88

Sustainable economic development provides growth opportunities as it increases the attractiveness of a region through a stable economy. With an increase in investments, capital flow increases. Among the many benefits, external investments provide job opportunities, development of rural areas, education opportunities, healthcare infrastructure and transport infrastructure. With an increase in development, accessibility and mobility becomes important. A developed area should provide transport infrastructure to ensure movement for the flow of goods, resources, and people, which translates to capital flow. Development and investment attract more external investment and allow connections between rural and urban areas, cities, provinces, and countries.

We argue that these three concepts or spheres (sustainable economic development, transport infrastructure and regional integration) intertwine. Each concept contributes to the other two, creating a cycle of positive or negative effects. Figure 2.3 presents the Integration Triangle, which provides a conceptual framework and understanding between the three concepts. The framework shows that while each has its benefits, they influence what happens in the other sphere. For example, increased capital flow allows transport infrastructure development between rural and urban areas. This, in turn, provides access from the

rural area to the urban area, increasing the participation in the economy of residents in the rural area. It creates a trade route between rural and urban markets, increasing capital flow to and from both areas. The local economies experience growth, once again creating opportunities for more development. While the benefits increase, so do the challenges. One challenge in the three spheres can create a challenge in the other two. The Integration Triangle can collapse if challenges are not addressed.

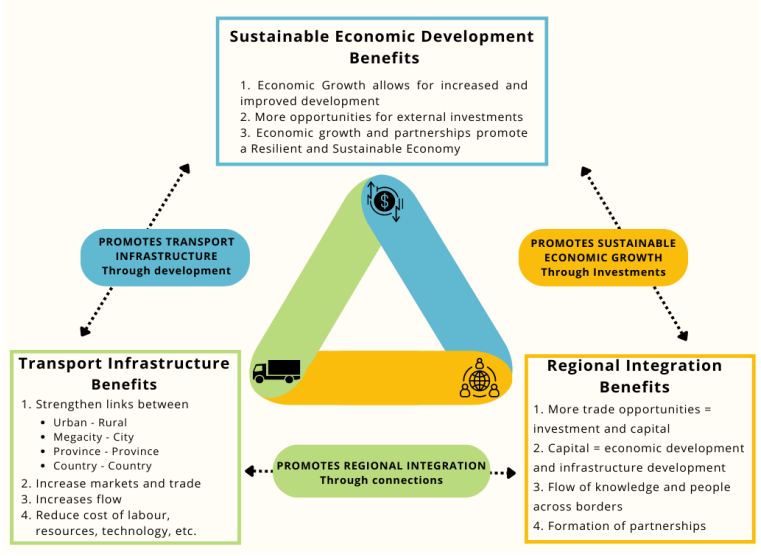

Figure 2.3: Integration Triangle: Conceptual Framework of Sustainable Economic Development, Transport Infrastructure and Regional Integration. Source: Author's own, 2024

Southern African Development Community

The SADC is an intergovernmental organisation established in 1980 to promote economic development, regional integration, and political stability in Southern Africa (Mosikari *et al.*, 2016). Currently, there are 16 member states, namely Angola, Botswana, Comoros, Democratic Republic of the

Congo, Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Tanzania, Zambia, and Zimbabwe (Pouris, 2018). The region covers an area of approximately 9,6 million square kilometres and has a population of nearly 400 million people (SARDC, 2019; Simkins, 2021). South Africa and Tanzania contribute the most to the population, with 17% and 16%, respectively (Country Economy, 2020). Countries such as Mauritius and Eswatini are small and do not make up 1% of the population.

The SADC's economy has the opportunity to grow as a whole and to grow the economies of the individual member states. Between 2021 and 2022, Zimbabwe and the Democratic Republic of the Congo showed the highest gross domestic product (GDP) growth at 8,5%. Lesotho's GDP decreased, followed by South Africa with a low GDP of 0,9%. The growth of these countries' GDP impacts the growth of the SADC region. Countries with negative GDP growth are less able to develop, upgrade or partake in inter-regional projects. For the SADC region to grow a strong economy, the local economies of each country need to improve and be sustainable on their own (Gawe, 2021).

The SADC's primary goal is to achieve economic development and regional integration through increased trade and investment, industrial development, and infrastructure development (Mosikari *et al.*, 2016). It seeks to achieve these objectives through programmes, including the SADC Free Trade Area, the SADC Investment Protocol, and the SADC Regional Infrastructure Development Master Plan. The SADC Free Trade Area promotes intra-regional trade by eliminating member states' tariffs and other trade barriers (Gawe, 2021). The SADC Investment Protocol promotes private sector investment in the region by providing a favourable investment climate and protection for foreign investors. The SADC Infrastructure Development Master Plan promotes the development of critical infrastructure, including transport networks and telecommunications infrastructure, to facilitate regional integration (SARDC, 2019). The SADC has made significant strides towards achieving its objectives, including

establishing the SADC Free Trade Area in 2008 and the ongoing implementation of the SADC Infrastructure Development Master Plan (Gawe, 2021). However, the organisation still faces challenges, including limited financial resources, political instability, and insufficient infrastructure.

Overview of Transport Infrastructure in the SADC Region

Transport infrastructure is critical to economic development and regional integration in the SADC. However, the current state of transport infrastructure in the region is characterised by poor maintenance, inadequate investment, and inadequate capacity (Akinyemi *et al*., 2019). One practical example of the poor state of transport infrastructure is the road network. Many roads are in poor condition, with potholes, inadequate drainage systems, and poor maintenance leading to frequent closures and delays. In Zambia, over 60% of the country's road network is in poor condition, leading to high transport costs (Infrastructure and Urban Development Department, 2021).

There has been a drive for regional integration between Zambia and South Africa, placing pressure on the state to find solutions for collective challenges (Söderbaum, 2012). The road network between Zambia and South Africa has been the main concern to reduce transportation time. However, the road networks within Zambia lack maintenance. This reflects how regional goals can lead to negligence of local challenges in a country (Infrastructure and Urban Development Department, 2021). Additionally, Zimbabwe's road network has been deteriorating for years, leading to increased traffic accidents, reduced trade and decreased economic activity (Mbara *et al*., 2010; Bafana, 2022; Chibamu, 2021). The Global Economy Survey rated the road network in Zimbabwe at 2.8 in 2019 [rating of 1 (low) to 7 (high)], with the rating having decreased since 2016 (Figure 2.4; The Global Economy, 2018). The rating of Zimbabwe's road networks is significantly lower than the average of 4,08 for 141 countries. Road infrastructure plays an important role in GDP growth and should be a main priority for

development and maintenance. The N1 highway, which connects Johannesburg to Zimbabwe's capital city, Harare, is notorious for its poor condition, leading to high transportation costs and delays (Mbara *et al.*, 2010).

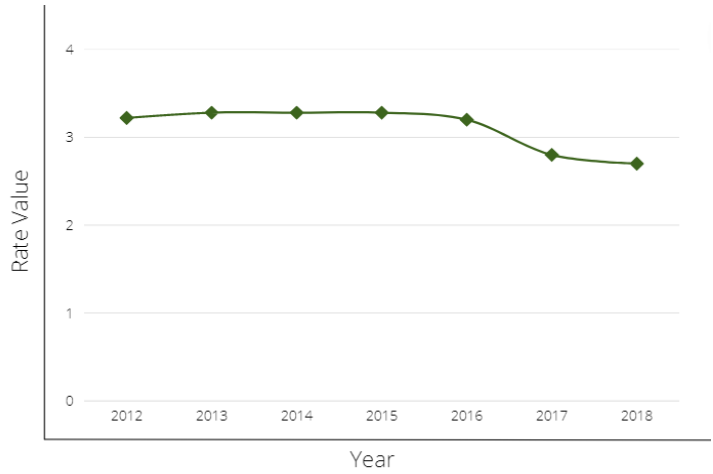

Figure 2.4: Rate Value of Zimbabwe's Road Networks Between 2012 and 2018. Source: Adapted from The Global Economy, 2018

Another example is the railway network, which is crucial for transporting bulk goods such as minerals, agricultural produce, and manufactured goods (Konstantinus *et al.*, 2019). Many railway lines in the SADC region are outdated and have limited capacity, leading to high transportation costs and long transit times (Konstantinus *et al.*, 2019). The Tanzania-Zambia Railway (TAZARA) line, which connects the port of Dar es Salaam to Zambia, has been declining for years due to a lack of maintenance and infrastructure development (Transport, Urban Development & ICT Department, 2015). The decline of the TAZARA line has led to reduced transport capacity and increased transport costs, which has negatively affected agricultural trade and economic growth (Takundwa, 2014). The poor state of railways in the region has resulted in a shift towards freight road transport, leading to increased congestion and wear and

tear on the road network. Malawi faces the same challenges, with limited transportation networks and corridors and poor infrastructure, leading to increased transport costs and reduced economic activity. The fragmentation of the transport network causes delays, uncertainties and unpredictability within trading markets, leading to an increase in logistic, travel, and storage costs, ultimately decreasing export profits (Arvis, Raballand & Marteau, 2010).

Water transport infrastructure is vital for facilitating trade and economic growth in the SADC region, but this infrastructure is inadequate. The region has multiple ports throughout the countries, including Cape Town, Durban, Port Elizabeth, Walvis Bay, Maputo, Lobito, Dar es Salaam and Mauritius (Notteboom, 2012). These ports are, however, served by a limited number of freight networks, hub-and-spoke centres and interconnected operations (Notteboom, 2012). Ports in the SADC region face significant challenges, including inadequate investment in equipment and infrastructure, which have resulted in inefficiencies and long waiting times (Ranganathan & Foster, 2011). The multiple gateway systems hinder the movement of goods and the growth of the economies. Moving towards a hub and spoke model can lower trade costs for shipping lines and reduce the time vessels spend in ports (Nabee & Walters, 2018).

For example, the Port of Beira in Mozambique has limited capacity and is only able to manage small vessels, leading to high transportation costs and limited access to markets for businesses in the region (Arvis, Raballand & Marteau, 2010). Many freight companies in Malawi tend to bypass Mozambique and travel to the Durban port since the turnaround time is faster, and they are able to manage large vessels and freights. This, however, increases the transportation cost and the untimely price of goods (Arvis, Raballand & Marteau, 2010).

Air cargo within Africa has increased over the last 20 years, but there have been low levels of development within the domestic air markets, and international cargo flights have remained restricted and uncompetitive (Njoya, 2016; Adewole & Struthers, 2019). Of the 230 airlines in Africa, only

5,5% of the world's commercial and freight aircraft operate across the different countries. Air infrastructure within SADC is limited, limiting the competition in the air cargo market and the region's economic growth (Njoya, 2016). Angola and Zimbabwe's airports are in poor condition, leading to limited air transport capacity and increased transport costs (Bhanye *et al.*, 2024). In Mozambique, the country's airports are outdated, limiting connectivity and accessibility for travellers and businesses. The aviation industry faces challenges, including limited runway capacity, inadequate infrastructure, obsolete navigation systems, high operating costs and delays for air cargo and passengers (Njoya, 2016). Air transportation is critical in distributing goods to landlocked countries across Africa (Adewole & Struthers, 2019; Bhanye *et al.*, 2024). Landlocked countries within the SADC, such as Botswana, Zambia and Zimbabwe, can benefit from air infrastructure and increase their international trade, promoting economic growth within the countries and the SADC. During the last quarter of 2014, African countries showed an increase of 10,5% in international trade and demand (Adewole & Struthers, 2019). While there has been an increase in international air cargo, up to 80% of intra-continental traffic, the SADC region and the rest of the world are owned by non-African airlines (Njoya, 2016). This means that while the trade is increasing in the SADC, not all the profit stays within the SADC.

Air transportation infrastructure and African-owned airlines are necessary for economic growth within the SADC (Abate, 2016) but will not necessarily address poverty challenges. However, it can play a crucial role in increasing trade, export income, the competitiveness of the countries and regions within the global market, economic growth and development (Adewole & Struthers, 2019).

Implications of Good Transport Infrastructure on Regional Integration and Economic Development in the SADC Region

Transport infrastructure is critical to the development of the SADC region, as it plays a crucial role in regional integration and economic development. Infrastructure facilitates the movement of goods and services across borders, reducing transportation costs and increasing market access. (Akinyemi *et al.*, 2019; Bolaky, 2019). Transport infrastructure in the SADC region includes roads, railways, ports, airports, and inland waterways. A study by Garcia-Milà and McGuire (1993) displayed the impacts of highway developments on the movement of goods and people, ultimately contributing to economic growth. Cantos, Gumbau-Albert and Maudos (2005) concluded that transport infrastructure and transportation positively impacted the development of one area and the connectivity and development of surrounding areas and the region. Facilitating regional trade through connected, well-maintained transport infrastructure will create more cultural exchange, trust, and increased cooperation between countries (Shahzad, 2006). This can lead to developing regional policies and frameworks that promote economic growth and development (Yang & Gupta, 2007).

Infrastructure development, investment and trade are all part of the SADC's objectives (SADC, 1992). Transport infrastructure is critical for promoting regional trade within the SADC region and overall development and economic growth (Barnekow & Kulkarni, 2017; Adewole & Struthers, 2019). Connecting countries within SADC through transport infrastructure can reduce the cost and time of moving goods and services to increase trade flow. The development of the Walvis Bay Corridor in Namibia, which connects the port of Walvis Bay to the landlocked countries of Botswana, Zambia, and Zimbabwe, has significantly enhanced trade and reduced transport costs. The Walvis Bay Corridor connects the port to Windhoek (Namibia), Johannesburg (South Africa), Gaborone (Botswana), Lusaka (Zambia) and Lubango (Angola); the corridor encompasses 11,621 km and also connects to other established trade networks within the SADC (Brundige *et al.*, 2011). The

four major corridors extending from the port of Walvis Bay are the Trans-Kalahari, Trans-Caprivi, Trans-Cunene, and Trans-Oranje highways (Brundige *et al*., 2011). Transport infrastructure can improve regional connectivity, which is essential for promoting economic development. The Trans-Kalahari corridor, which connects South Africa to Namibia and the Trans-Caprivi corridor, which connects Zambia to Namibia, have significantly improved regional connectivity and facilitated trade (Simon-Agolory, 2019). Investors are attracted to regions with efficient transport infrastructure, as it reduces costs and enables efficient movement.

When transport infrastructure and trade routes are efficient and well maintained, they increase economic development within surrounding areas, creating economic and social opportunities (Kgamanyane, 2015). Economic development creates employment opportunities directly and indirectly (Scholvin & Plagemann, 2014). Direct employment is created through the construction and maintenance of transport infrastructure. The improved transport infrastructure creates indirect employment through increased economic activity. For instance, the Maputo Development Corridor in Mozambique has created employment opportunities in the transport, logistics, and tourism sectors. The British Vale mining company in Mozambique had employed more than 5,000 Mozambicans by 2010, making up more than 90% of their employees (Scholvin & Plagemann, 2014). The development of transport infrastructure can reduce the cost of transportation and enable people to access essential services, markets, healthcare, education, and other essential services, all of which contribute to poverty reduction (Scholvin & Plagemann, 2014). The effect on poverty may not, in all cases, be felt directly but indirectly through the spill-over effect of economic growth (Porter, 2014).

Developing sustainable transport infrastructure contributes to environmental sustainability (Miller, 2016). A good transport infrastructure leads to reduced emissions and improved air quality. For example, the use of electric vehicles and other clean energy technologies in transport infrastructure can significantly reduce carbon emissions (Koengkan et al.,

2022). The development of transport infrastructure improves resilience and response to natural disasters (Al-Humaiqani & Al-Ghamdi, 2022). By improving transport infrastructure, countries can better prepare for and respond to natural disasters like floods and cyclones. For example, the Nacala Corridor in Mozambique enables the efficient delivery of emergency aid and supplies during natural disasters. The development of transport infrastructure facilitates connection and interaction within Africa and leads to the transfer of technology and skills between countries, thus increasing regional innovation (Shahzad, 2006). Transport infrastructure contributes to better healthcare (reduced morbidity and mortality rates) by reducing travel time and improving access to healthcare facilities (Brown, 2019).

Improved access to regional and global markets increases competitiveness, enabling the development of regional value chains, which contributes to economic growth and development (Calatayud *et al.*, 2016; Hummels, 2007). By connecting regions and facilitating trade, businesses can use regional resources, reducing dependence on external markets. This can lead to the development of new industries and sectors, contributing to economic diversification and increased competitiveness. Furthermore, transport infrastructure may increase regional tourism (Polyzos & Tsiotas, 2020). Improving access to tourist destinations and transport infrastructure attracts more tourists, increasing capital flow (Webster & Ivanov, 2014). For example, the development of the Victoria Falls Bridge between Zambia and Zimbabwe significantly increased tourism in the region.

Transport infrastructure development can promote regional cooperation by providing a platform for countries to work towards shared objectives. Countries can collaborate on projects that benefit the entire region by developing transport infrastructure, such as transport corridors and harmonising transport policies. This can increase trust and cooperation between countries, promoting regional integration and economic development.

Transport infrastructure has several practical positive implications for regional integration and economic development

in the SADC region. One example is the Maputo Corridor, which connects the port of Maputo in Mozambique to Gauteng Province in South Africa (Scholvin & Plagemann, 2014). The corridor includes a road network, a rail network, and the port of Maputo, which has contributed to the economic development of both Mozambique and South Africa. The corridor facilitates the movement of goods between the two countries, thereby reducing transportation costs and increasing market access (Scholvin & Plagemann, 2014). The development of the corridor led to the growth of industries in the region, such as mining, agriculture, and manufacturing. Another example is the Kazungula Bridge, which connects Zambia and Botswana over the Zambezi River. The Kazungula Bridge was developed to increase trade between the SADC countries, especially Botswana, Zambia, Zimbabwe and South Africa (Sengwaketse & Maiketso, 2018). The bridge established a trade corridor between Zambia and Botswana and increased trade by reducing transportation costs. Before the bridge's construction, traders used ferries to transport goods across the river, which was time-consuming and expensive. The bridge reduced congestion at the border post, reducing waiting times for goods to clear customs. The Chirundu Bridge in Zambia is another example of transport infrastructure's impact on economic development and regional integration (Muqayi & Manyeruke, 2015).

The Nacala Corridor also highlights the positive implications of transport infrastructure on regional integration and economic development. The corridor connects the port of Nacala in Mozambique to the landlocked countries of Malawi and Zambia. The corridor includes a rail network and the port of Nacala. The development of the Nacala Corridor significantly improved market access in Malawi and Zambia. Before the corridor, these countries heavily relied on the Port of Durban in South Africa for trade. The corridor reduced transportation costs and increased market access, promoting economic development in the region (Byiers, Karkare & Miyandazi, 2020). The construction of the Tazara railway line, which connects Tanzania's port of Dar es Salaam to Zambia's copper belt, significantly improved regional integration. Before the

construction of the railway line, Zambia relied on South Africa's ports for trade, which resulted in high transportation costs and limited access to markets. The Tazara railway line provided cost-effective and efficient transportation, enabling Zambia to access the Indian Ocean and expand its trading networks beyond South Africa. The Port of Durban in South Africa is a gateway for imports and exports for many SADC countries. The port's strategic location has facilitated the movement of goods within the region and beyond, making it a critical node for regional integration (Arvis *et al*., 2010).

Implications of Bad Transport Infrastructure on Regional Integration and Economic Development in the SADC Region

Poor transport infrastructure has significant negative implications for regional integration and economic development in the SADC region since it limits connectivity between countries (Mushonga, 2014). With no railway linking Tanzania, Zambia, and Malawi, it becomes difficult for businesses to trade, limiting opportunities for economic growth. Inadequate transport networks lead to high transaction costs. This is seen in Zimbabwe, where the lack of a reliable road network makes it difficult to transport goods, resulting in higher transportation costs. Consequently, products are less competitive in regional and global markets, limiting profit from the trade. Limited access to resources is due to the poor transport infrastructure within the SADC, hindering economic growth and development. Angola has limited access to abundant natural resources, reducing economic growth and development opportunities, specifically in the industrial sector.

Trade barriers between Botswana and neighbouring countries hinder regional integration and reduce trade opportunities, market competition, social exchange and economic growth. In Namibia, trade barriers reduce competitiveness and limit opportunities for product and market improvement (Yonk & Bobek, 2020). Namibian businesses struggle to compete in regional and global markets, reducing

growth opportunities and related socio-economic impacts. Regional integration is limited between Zambia and Zimbabwe due to the lack of trade routes, hindering economic cooperation and reducing development opportunities (Muqayi & Manyeruke, 2015). Poor transport infrastructure in the SADC limits job opportunities, as seen in Lesotho, which results in high rural-urban migration rates and limited growth in rural areas. Food security has been reduced in Zimbabwe and Lesotho since rural farmers have limited access to sell their produce at markets, and people in rural areas struggle to access markets in urban areas (Crush *et al.*, 2012).

Direct foreign investment is limited within the SADC due to the poor transport infrastructure (Akinyemi *et al.*, 2019). The Democratic Republic of the Congo is an example, with limited direct foreign investment in the mining and tourism sectors. Due to limited access, many view the mining and tourism sector as unreliable and difficult to navigate. The lack of a reliable transport network in Mozambique limits access to the country's beautiful beaches and wildlife, reducing opportunities for tourism and economic growth. There are few opportunities for the tourism sector to grow within Mozambique since tourists tend to stay in one place when they visit the country.

Due to the limited transportation networks within the SADC, residents have limited access to healthcare, negatively impacting communities and residents' well-being (Brown *et al.*, 2019). This lack of transportation networks indirectly impacts human capital in rural communities. Farmers in Tanzania find it difficult to transport their goods to markets, settling for small local markets with lower profits (Takundwa, 2014). Rural communities also face energy and electricity challenges, leading to lower production levels. Thus, rural farming communities not only have low food production, poor healthcare, lack of electricity and small-scale markets but also have no outside investment or opportunities to improve their economic state due to the poor transport infrastructure.

In short, poor transport infrastructure has far-reaching implications for regional integration and economic development

in the SADC. As such, developing and maintaining transport infrastructure must continue to be a priority for SADC governments and policymakers to promote regional integration and sustainable economic development.

Conclusion and Recommendations

Transport infrastructure plays a crucial role in the SADC's regional integration and economic development. This chapter provided insights into the state of transport infrastructure and the implications thereof on economic development and regional integration of the SADC. The findings demonstrate that the state of transport infrastructure in the region is a significant challenge, enhancing negative implications for regional integration and economic development. Inadequate and inefficient transport infrastructure leads to high transportation costs, long lead times, and reduced competitiveness of the region's economy. Furthermore, the lack of transport connectivity and integration between SADC countries limits the flow of goods and services, reducing the effectiveness of regional integration policies. However, there are some positive developments, including infrastructure projects, such as the North-South Corridor, which improves connectivity and enhances trade between SADC countries. Therefore, governments must prioritise transport infrastructure development to achieve greater regional integration and economic development in the SADC. The region can achieve its economic development and regional integration objectives with sustained investment and collaborative efforts. Based on the chapter's analysis of the state and implications of transport infrastructure, the following recommendations are made:

- Increase investment in transport infrastructure: Governments in the region must prioritise investment in transport infrastructure to improve connectivity. The investment should focus on constructing modern highways, railways, airports, and seaports.
- Improve maintenance of transport infrastructure: This will ensure that infrastructure remains in good condition, reducing the costs associated with repairs and replacement.

Governments should allocate sufficient resources to maintain and repair the transport infrastructure.

- Promote regional integration: Governments should work together to improve connectivity by constructing new transport networks. This will facilitate the movement of goods and people across borders, which is essential for economic development.
- Enhance the role of the private sector: Governments should create an enabling environment that promotes private sector investment in the transport sector. This can be achieved by developing public-private partnerships and creating incentives for private-sector investment.
- Implement a regional transport policy: The policy should outline the priorities for transport infrastructure development in the region and provide guidelines for allocating resources.

References

Abate M. 2016. Economic effects of air transport market liberalisation in Africa. *Transportation Research Part A: Policy and Practice*, 92:326-337. https://doi.org/10.1016/j.tra.2016.06.014

Adewole A & Struthers JJ. 2019. Trade and economic development in Africa: The interaction between logistics and global value chains. In: *Logistics and Global Value Chains in Africa: The Impact on Trade and Development*. Brighton, UK. 3-15. https://doi.org/10.1007/978-3-319-77652-1_1

Akinyemi O, Efobi U, Osabuohien E & Alege P. 2019. Regional integration and energy sustainability in Africa: Exploring the challenges and prospects for ECOWAS. *African Development Review*, 31(4):517-528. https://doi.org/10.1111/1467-8268.12406

Al-Humaiqani MM & Al-Ghamdi SG. 2022. The built environment resilience qualities to climate change impact: Concepts, frameworks, and directions for future research. *Sustainable Cities and Society*, 80:1-17. https://doi.org/10.1016/j.scs.2022.103797

Arvis JF, l Raballand & Marteau JF. 2010. *The cost of being landlocked: Logistics costs and supply chain reliability*. World Bank Publications. https://doi.org/10.1596/978-0-8213-8408-4

Bafana B. 2022. Zimbabwe unsafe roads could drive the economy around the bend. *Global Issues*. [Retrieved 5 May 2023] https://www.globalissues.org/news/2022/04/05/30525

Barnekow SE & Kulkarni KG. 2017. Why regionalism? A look at the costs and benefits of regional trade agreements in Africa. *Global Business Review*, 18(1):99-117. https://doi.org/10.1177/0972150916666881

Bhanye J, Hugo M, Matamanda A & Mocwagae K. 2024. Reimagining travellers' airport experience: Innovative approaches for a post-COVID-19 Pandemic future. In: *Making Sense of Planning and Development for the Post-Pandemic Cities*. Singapore: Springer Nature. 97-138. https://doi.org/10.1007/978-981-97-5481-6_6

Bolaky B. 2019. Regional integration: A lever for positive tourism development in Africa? In: M Mkono (ed). *Positive Tourism in Africa*. Routledge. 119-136. https://doi.org/10.4324/9780429428685-11

Brown V, Barr A, Scheurer J, Magnus A, Zapata-Diomedi B & Bentley R. 2019. Better transport accessibility, better health: A health economic impact assessment study for Melbourne, Australia. *International Journal of Behavioral Nutrition and Physical Activity*, 16(1):1-10. https://doi.org/10.1186/s12966-019-0853-y

Brundige D, Dawson E, Massey M & Moore S. 2011. An economic development strategy for the Trans-Kalahari Corridor. *Worcester Polytechnic Institute. Project Number 49-ULBNAM2*.

Byiers B., Karkare P. & Miyandazi L. 2020. *A political economy analysis of the Nacala and Beira corridors.* European Centre for Development Policy Management (ECDPM), Discussion Paper No. 277:21-33. [Retrieved 13 February 2023] https://ecdpm.org/application/files/4916/5546/8623/A-Political-Economy-Analysis-Nacala-Beira-Corridors-Discussion-Paper-277-July-2020-ECDPM.pdf

Calatayud A, Palacin R, Mangan J, Jackson E & Ruiz-Rua A. 2016. Understanding connectivity to international markets: a systematic review. *Transport Reviews*, 36(6):713-736. https://doi.org/10.1080/01441647.2016.1157836

Cantos P, Gumbau-Albert M, & Maudos J. 2005. Transport infrastructures, spillover effects and regional growth: evidence of the Spanish case. *Transport Reviews*, 25(1):25-50. https://doi.org/10.1080/0144164100016768 52

CEPAL 2014. Regional integration: Towards an inclusive value chain strategy. LC/G.2594(SES.35/11. United Nations. https://doi.org/10.1080/014416410001676852

Chen X, Dong Q, Zhu H, Huang B & Burdette EG. 2017. Contributions of condition measurements on the latent pavement condition by confirmatory factor analysis. *Transportmetrica A: Transport Science*, 15(1):2-17. https://doi.org/10.1080/23249935.2017.1369195

Chibamu A. 2021. *Government admits state of Zim Roads, Bridges deplorable*, *NewZimbabwe.com*. [Retrieved 5 May 2023] https://www.newzimbabwe.com/govt-admits-state-of-zim-roads-bridges-deplorable/

Country Economy. 2020. Population of SADC member states. [Retrieved 10 May 2023] https://countryeconomy.com/countries/groups/southern-african-development-

Crescenzi R, Di Cataldo M & Rodríguez-Pose A. 2016. Government quality and the economic returns of transport infrastructure investment in European regions. *Journal of Regional Science*, 56(4):555-582. https://doi.org/10.1111/jors.12264

Crush J, Frayne B & Pendleton W. 2012. The crisis of food insecurity in African cities. *Journal of Hunger & Environmental Nutrition*. 7(2-3):271-292. https://doi.org/10.1080/19320248.2012.702448

Department of Trade, Industry and Competition 2023. *Trade, industry and competition on importance of innovation in opening export markets for South African businesses*. Republic of South Africa. [Retrieved 22 April 2023] https://www.gov.za/speeches/innovation-critical-opening-export-markets-sa-businesses-%E2%80%93-dtic-23-feb-2023-0000

Dominguez-Torres, C. & Foster, V. 2011. Cameroon's Infrastructure: A Continental Perspective. Africa Infrastructure Country Diagnostic (AICD) Country Report. Washington, DC. https://doi.org/10.1596/1813-9450-5822

Elliott J. 2012. *An introduction to sustainable development*. Routledge. https://doi.org/10.4324/9780203844175

Fagbayibo B. 2013. Common problems affecting supranational attempts in Africa: An analytical overview. *Potchefstroom Electronic Law Journal/Potchefstroomse Elektroniese Regsblad*, 16(1):31-69. https://doi.org/10.17159/1727-3781/2013/v16i1a2303

Gammadigbe, V. 2021. *Is regional trade integration a growth and convergence engine in Africa*? International Monetary Fund. IMF Working Papers. 29 January. https://www.imf.org/en/Publications/WP/Issues/2021/01/29/Is-Regional-Trade-Integration-a-Growth-and-Convergence-Engine-in-Africa-50040 https://doi.org/10.5089/9781513567716.001

Garcia-Milà T & McGuire TJ. 1993. Industrial mix as a factor in the growth and variability of states' economies. *Regional Science and Urban Economics*, 23(6):731-748. https://doi.org/10.1016/0166-0462(93)90019-B

Gawe P. 2021. An evaluation of the SADC Free Trade Area: A case study of Zimbabwe's integration efforts. *Open Access Library Journal*, 8(10):1-17. https://doi.org/10.4236/oalib.1107868

Golub A. 2014. Moving beyond Fordism: "Complete Streets" and the changing political economy of urban transportation. In: S Zavestoski & J Agyeman (eds). *Complete Streets: Processes, Practices, and Possibilities.* Routledge.

Göpel M. 2016. The great mindshift; The Anthropocene: Politik economics society science. *Cham: Springer.* https://doi.org/10.1007/978-3-319-43766-8

Guzman LA & Oviedo D. 2018. Accessibility, affordability and equity: Assessing 'pro-poor' public transport subsidies in Bogotá. *Transport Policy*, 68:37-51. https://doi.org/10.1016/j.tranpol.2018.04.012

Hák T, Janoušková S & Moldan B. 2016. Sustainable Development Goals: A need for relevant indicators. *Ecological Indicators*, 60:565-573. https://doi.org/10.1016/j.ecolind.2015.08.003

Hermwille L. 2017. *En route to a just global energy transformation? The formative power of the SDGs and the Paris Agreement.* Friedrich-Ebert-Stiftung [Retrieved 18 June 2022] https://library.fes.de/pdf-files/iez/13453.pdf

Hrelja R. 2015. Integrating transport and land-use planning? How steering cultures in local authorities affect implementation of integrated public transport and land-use planning. *Transportation Research Part A: Policy and Practice*, 74:1-13. https://doi.org/10.1016/j.tra.2015.01.003

Hummels D. 2007. Transportation costs and international trade in the second era of globalisation. *Journal of Economic Perspectives*, 21(3):131-154. https://doi.org/10.1257/jep.21.3.131

Hussin H, Osama A, El-Dorghamy A & Abdellatif MM. 2021. Towards an integrated mobility system: The first and last mile solutions in developing countries; the case study of New Cairo. *Transportation Research Interdisciplinary Perspectives*, 12:1-11. https://doi.org/10.1016/j.trip.2021.100469

Ibraeva A, de Almeida Correia GH, Silva C, & Antunes AP. 2020. Transit-oriented development: A review of research achievements and challenges. *Transportation Research Part A: Policy and Practice*, 132:110-130. https://doi.org/10.1016/j.tra.2019.10.018

Infrastructure and Urban Development Department. 2021. *Sustainable Market Access for African Road Transport - Smart - Final Report.* African Development Bank Group. Abidjan.

Ingvardson JB & Nielsen OA. 2018. Effects of new bus and rail rapid transit systems: An international review. *Transport Reviews*, 38(1):96-116. https://doi.org/10.1080/01441647.2017.1301594

Kalaoane RE, Matamanda AR & Bhanye JI. 2024. The complex web of land use planning, legislation and urban mobility in Maseru, Lesotho. *Discover Sustainability*, 25;5(1):40. https://doi.org/10.1007/s43621-024-00226-1

Kgamanyane M. 2015. The importance of road transport infrastructure development and maintenance in trade facilitation: A South African case. Master's thesis. Cape Town: University of Cape Town.

Koengkan M, Fuinhas JA, Teixeira M, Kazemzadeh E, Auza A, Dehdar F & Osmani F. 2022. The capacity of battery-electric and plug-in hybrid electric vehicles to mitigate CO_2 emissions: Macroeconomic evidence from European Union Countries. *World Electric Vehicle Journal*. 13(4):1-22. https://doi.org/10.3390/wevj13040058

Konstantinus A, Zuidgeest M, Christodoulou A, Raza Z & Woxenius J. 2019. Barriers and enablers for short sea shipping in the Southern African Development Community. *Sustainability*, 11(6):1-16. https://doi.org/10.3390/su11061532

Kumar A & Barrett F. 2008. Stuck in traffic: Urban transport in Africa. *AICD Background paper*.

Mbara T, Dumba S, & Mukwashi T. 2014. Multi-stakeholder dialogue on formal and informal forms of public transport in Harare, Zimbabwe: Convergence or divergence perspective. *Journal of Transport and Supply Chain Management*, 8(1):1-9. https://doi.org/10.4102/jtscm.v8i1.140

Mbara TC, Nyarirangwe M & Mukwashi T. 2010. Challenges of raising road maintenance funds in developing countries: An analysis of road tolling in Zimbabwe. *Journal of transport and supply chain management*, 4(1):151-175. https://doi.org/10.4102/jtscm.v4i1.66

Mensah J. 2019. Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review. *Cogent Social Sciences*, 5(1):1-21. https://doi.org/10.1080/23311886.2019.1653531

Miller P, de Barros AG, Kattan L & Wirasinghe SC. 2016. Public transportation and sustainability: A review. *KSCE Journal of Civil Engineering*, 20(3):1076-1083. https://doi.org/10.1007/s12205-016-0705-0

Mlambo DN 2020. The quest for post-colonial regional integration: Examining the Southern African Development Community (SADC) in Southern Africa post-1992. *Journal of African Foreign Affairs*, 7(1):23-48. https://doi.org/10.31920/2056-5658/2020/7n1a2

Mosikari TJ, Senosi MC & Eita JH. 2016. Manufactured exports and economic growth in Southern African Development Community (SADC) region: A panel cointegration approach. *Acta Universitatis Danubius: Oeconomica*, 12(5).

Msemburi C & Liza L. 2014. Trade Facilitation in East and Southern Africa. *World Customs Organization*.

Muqayi S & Manyeruke C. 2015. The impact of the Chirundu One Stop Border Post in addressing border protectionist challenges. *Mediterranean Journal of Social Sciences*, 6(S2):11-20. https://doi.org/10.5901/mjss.2015.v6n6s2p11

Mushonga M. 2014. An evaluation of the regulation of non-tariff barriers to trade in SADC free trade area. Doctoral dissertation. Stellenbosch: Stellenbosch University.

Nabee, S. & Walters J. 2018. *The shifting hierarchy of strategic SADC liner ports*. University of Johannesburg. [Retrieved 17 August 2022] https://hdl.handle.net/10210/288784

Ndukwe FO. 2004. Promoting Trade. In: SM Nsouli SM (ed). *The new partnership for Africa's development*. 88-115.

Njoya ET. 2016. Africa's single aviation market: The progress so far. *Journal of Transport Geography*, 50:4-11. https://doi.org/10.1016/j.jtrangeo.2015.05.009

Notteboom TE. 2012. Towards a new intermediate hub region in container shipping? Relay and interlining via the Cape route vs. the Suez route. *Journal of Transport Geography*, 22:164-178. https://doi.org/10.1016/j.jtrangeo.2012.01.003

Polyzos S & Tsiotas D. 2020. The contribution of transport infrastructures to the economic and regional development. *Theoretical and Empirical Research in Urban Management*, 15(1):5-23.

Porter G. 2014. Transport services and their impact on poverty and growth in rural sub-Saharan Africa: A review of recent research and future research needs. *Transport Reviews*, 34(1):25-45. https://doi.org/10.1080/01441647.2013.865148

Pouris A. 2018. Water research and collaboration in the Southern African Development Community. *Water SA*, 44(3):358-364. https://doi.org/10.4314/wsa.v44i3.03

Ranganathan R & Foster V. 2011. *East Africa's Infrastructure: A Continental Perspective*. World Bank, Africa Region, Sustainable Development Unit. https://doi.org/10.1596/1813-9450-5844

Rondinelli DA. 2019. *Applied methods of regional analysis: The spatial dimensions of development policy*. Routledge.

SADC 1992. Declaration and Treaty of SADC, 28 Feb 1992. [Retrieved 12 May 2023] https://www.sadc.int/document/declaration-treaty-sadc-1992#:~:text=The%20Declaration%20and%20Treaty%20specify,resources%20and%20environment%3B%20social%20welfare%2C

SARDC. 2019. *Regional Infrastructure Development: Short Term Action Assessment 2019*. SADC, SARDC. Gaborone, Harare.

Schneider CJ. 2017. The political economy of regional integration. *Annual Review of Political Science*, 20:229-248. https://doi.org/10.1146/annurev-polisci-051215-023006

Scholvin S & Plagemann J. 2014. *Transport infrastructure in central and northern Mozambique: The impact of foreign investment on national development and regional integration.* SAIIA Occasional Paper No 175.

Sengwaketse M & Maiketso J. 2018. *Trade infrastructure and the budget: Briefing note.* Botswana Institute for Development Policy Analysis.

Shahzad A. 2006. What is globalisation: Historical background. *Jadavpur Journal of International Relations*, 10(1):204-212. https://doi.org/10.1177/0973598406110013

Simkins C. 2021. *The Southern African Development Community: Population*. Helen Suzman Foundation. [Retrieved 22 April 2023] https://hsf.org.za/publications/hsf-briefs/the-southern-african-development-community-i-population

Simon-Agolory KM. 2019. From Botswana to Namibia: Getting the Trans-Kalahari railway on track. *Emerald Emerging Markets Case Studies*, 9(1):1-22. https://doi.org/10.1108/EEMCS-03-2018-0047

Söderbaum F. 2012. Theories of regionalism. In: M. Beeson & R Stubbs (eds). *Routledge handbook of Asian regionalism* (Vol. 21). London: Routledge. 11-21.

Takundwa, D.R. 2014. Infrastructure development in economic crisis and recovery: The rail cargo sector in Zimbabwe since 2000. Doctoral dissertation. Durban: University of KwaZulu Natal.

The Global Economy. 2018. *Zimbabwe Roads Quality data: Chart.* [Retrieved 5 May 2023]. https://www.theglobaleconomy.com/Zimbabwe/roads_quality/

Tomislav K. 2018. The concept of sustainable development: From its beginning to the contemporary issues. *Zagreb International Review of Economics & Business*, 21(1):67-94. https://doi.org/10.2478/zireb-2018-0005

Transport, Urban Development & ICT Department. 2015. *Rail Infrastructure in Africa: Financing Policy Options*. African Development Bank Group. Abidjan.

WCED. 1987. World commission on environment and development. *Our Common Future*, 17(1):1-91.

Webster C & Ivanov S. 2014. Transforming competitiveness into economic benefits: Does tourism stimulate economic growth in more competitive destinations? *Tourism Management* 40:137-140. https://doi.org/10.1016/j.tourman.2013.06.003

Wood A. 2015. The politics of policy circulation: Unpacking the relationship between South African and South American cities in the adoption of bus rapid transit. *Antipode*. 47(4):1062-1079. https://doi.org/10.1111/anti.12135

World Bank. 2023 *Regional Integration*. [Retrieved 22 May 2023] https://www.worldbank.org/en/topic/regional-integration/overview

Yang Y & Gupta S. 2007. Regional trade arrangements in Africa: Past performance and the way forward. *African Development Review*, 19(3):399-431. https://doi.org/10.1111/j.1467-8268.2007.00169.x

Yonk RM & Bobek V (eds). 2020. Perspectives on economic development: Public policy, culture, and economic development. doi:10.5772/intechopen.82996 https://doi.org/10.5772/intechopen.82996