International Journal of Economics, Commerce and Management
United Kingdom ISSN 2348 0386 Vol. 13, Issue 10, Oct 2025

https://ijecm.co.uk/

ASSESSING THE CURRENT STATE AND ECONOMIC BENEFITS OF MARITIME CONNECTIVITY ON LAKE TANGANYIKA FOR TANZANIA

Ghadaf Hassan Chambo
Dar es Salaam Maritime Institute, Maritime Transport Department,
Sokoine Drive Dar es Salaam, Tanzania
ghadaf.chambo@tasac.go.tz

Benjamini Meli Mbeba
Dar es Salaam Maritime Institute, Maritime Transport Department,
Sokoine Drive Dar es Salaam, Tanzania
mwendapole.msabaha@gmail.com

Abstract

This paper investigates the current state of maritime connectivity on Lake Tanganyika and analyses the potential economic benefits of its improvement for Tanzania. Lake Tanganyika, one of the world's largest freshwater bodies, is central to trade, livelihoods, and regional integration in East and Central Africa. However, infrastructural gaps, outdated vessels, and weak logistical networks constrain its economic potential. Using a mixed-methods approach combining stakeholder surveys, interviews, and secondary data, the study found that existing maritime infrastructure is moderately efficient but unevenly developed. Respondents emphasised opportunities for trade expansion, tourism development, job creation, and infrastructure investment if connectivity is enhanced. The findings suggest that strategic investment in port facilities, fleet modernisation, and supportive policies could unlock significant socio-economic benefits for Tanzania.

Keywords: Maritime connectivity, Lake Tanganyika, Economic impact, Trade, Tanzania

INTRODUCTION

Waterways' connectivity is crucial for global trade, economic growth, and sustainability. Inland and coastal waterways provide cost-effective, high-capacity transport, reducing reliance on roads and rail networks (UNCTAD, 2021; Rodrigue, 2020). About 80% of global trade by volume relies on maritime transport, linking markets worldwide (IMO, 2019). Efficient waterways also support regional integration, supply chain resilience, lower emissions, and local livelihoods through fisheries and tourism (World Bank, 2020; Rodrigue, 2020; UNCTAD, 2021).

Maritime connectivity and transportation infrastructure are crucial drivers of economic growth, regional integration, and sustainable development in Africa. Efficient inland and coastal waterways facilitate trade, tourism, and livelihoods, while inadequate infrastructure can limit access to markets, increase costs, and perpetuate poverty (UNDP, 2020; Mwase, Manda, & Mkumbwa, 2017). Waterways also influence environmental sustainability and security, with poorly managed transport systems contributing to resource degradation and border disputes (Cohen et al., 2016; Sturman & Snyder, 2018).

Within this broader context, Lake Tanganyika, the second deepest freshwater lake globally and the longest on the African continent, stretching approximately 673 kilometres, plays a strategic role in regional trade and community livelihoods. The lake borders Tanzania, the Democratic Republic of Congo (DRC), Burundi, and Zambia, providing significant potential for fisheries, tourism, and cross-border trade (Ngowi & Shauri, 2019; Encyclopedia Britannica, 2021). Despite its importance, maritime connectivity on Lake Tanganyika has historically been limited, with outdated vessels, insufficient infrastructure, and inefficient transportation systems hindering the movement of goods and people (Mwase, Manda, & Mkumbwa, 2017; Ngowi & Shauri, 2019).

The underdeveloped maritime sector has resulted in economic marginalisation of lakeshore communities, high transport costs, restricted market access, and delayed goods delivery, which together impede poverty alleviation and local economic growth (Mwase, Manda, & Mkumbwa, 2017; UNDP, 2020). In addition, environmental sustainability is compromised, as unsustainable transport and fishing practices threaten the lake's ecological health (Cohen et al., 2016). Security challenges, including illegal fishing, smuggling, and border disputes, further complicate development efforts and regional stability (Sturman & Snyder, 2018).

Given these challenges, improving maritime connectivity on Lake Tanganyika is critical. Upgrading infrastructure, modernising fleets, and enhancing transport systems could reduce costs, improve efficiency, expand market access, and stimulate economic growth in Tanzania and the DRC, Burundi, and Zambia. It is strategically positioned to facilitate cross-border trade and promote regional economic integration. (Mikenzi et al., 2015). Effective connectivity would

also support environmental protection, enhance regional security, and unlock the lake's untapped potential for fisheries, tourism, and trade (Storey et al., 2017; Ngowi & Shauri, 2019).

This study, therefore, seeks to examine the economic impacts of improved maritime connectivity on Lake Tanganyika, providing insights for policymakers, government agencies, and international organisations. By focusing on Tanzania, the research aims to highlight opportunities for sustainable development, regional integration, and enhanced livelihoods for communities dependent on the lake's resources (Ngowi & Shauri, 2019; Mikenzi et al., 2015; Mwase, Manda, & Mkumbwa, 2017; UNDP, 2020; Cohen et al., 2016; Sturman & Snyder, 2018; Storey et al., 2017; Encyclopedia Britannica, 2021).

Despite its strategic importance, maritime operations on the Tanzanian side are constrained by infrastructural limitations, outdated vessels, and operational inefficiencies. This study, therefore, seeks to assess the current state of maritime connectivity on Lake Tanganyika and evaluate the potential economic benefits that improved connectivity could deliver for Tanzania.

LITERATURE REVIEW

Theoretical Review

This study integrates Network Theory, founded by Freeman (1979) and expanded by Borgatti and Li (2009), and Regional Economic Integration Theory, developed by Balassa (1961), to examine maritime connectivity and its economic impact on Lake Tanganyika. Network Theory provides a framework for analysing the structural and operational aspects of the maritime system, including ports, vessels, and transport routes, helping identify inefficiencies and optimise the flow of goods and people (Borgatti & Li, 2009). However, it is limited in addressing the broader economic and policy outcomes of connectivity improvements. Regional Economic Integration Theory complements this by emphasising the socio-economic benefits of enhanced connectivity, such as increased trade, regional integration, and poverty reduction (Balassa, 1961; Notteboom, 2012; Mwase, Manda, & Mkumbwa, 2017).

By combining these theories, the study links technical network improvements with economic development outcomes, enabling a comprehensive analysis of both operational efficiency and regional socio-economic benefits. This integrated approach ensures that interventions in Lake Tanganyika's maritime system are assessed in terms of both functional performance and their potential to foster sustainable regional growth (Freeman, 1979; Borgatti & Li, 2009; Balassa, 1961; Mwase, Manda, & Mkumbwa, 2017; Notteboom, 2012).

Empirical Literature Review

Globally, enhanced maritime connectivity has been consistently linked to increased trade volumes, reduced logistics costs, and poverty alleviation. For example, Bichou and Gray (2014), in their quantitative analysis of port efficiency indicators, demonstrated that efficient maritime infrastructure improves trade competitiveness. Wang, Meng, and Yang (2016) used econometric modelling of panel data from 50 countries to show that connectivity directly impacts international trade flows. Rodrigue (2020) further emphasised, through a mixed-methods review of global transport systems, that integrated inland and coastal waterway networks significantly enhance economic efficiency and market access.

In Africa, however, inadequate port facilities and underdeveloped inland water transport networks often undermine these economic benefits. Notteboom (2012) conducted a comparative analysis of African ports, highlighting that limited infrastructure constrains trade efficiency. Anabia-Tiah (2022) employed mixed methods, including questionnaires and interviews with West African maritime training institutions, to assess digital capacity and human capital challenges in inland maritime operations. Similarly, the UNDP (2020) applied secondary data analysis and case studies to demonstrate how underdeveloped waterways in the Great Lakes region restrict regional economic development.

Within Sub-Saharan Africa, studies indicate substantial untapped potential for inland waterways to drive trade and economic integration. Storey, Mwase, and Mikenzi (2017) used surveys, interviews, and economic modelling to assess fisheries, tourism, and trade opportunities along Lake Tanganyika. Cohen, Sarapura, and Mugo (2016) applied a mixed-methods approach combining environmental impact assessment with transport and trade data to demonstrate the economic significance of inland water transport. Mwase, Manda, and Mkumbwa (2017) conducted quantitative analysis on transport costs, trade flows, and market access in Tanzania and DRC, showing that inadequate maritime connectivity increases costs and delays.

In East Africa, research on Lake Victoria and regional ports underscores the economic benefits of improved maritime transport. Mbombela, Mwase, and Mkumbwa (2018) used surveys and secondary trade data to show that enhanced connectivity increases trade efficiency and reduces transportation costs. Kiplimo and Ikua (2016) employed questionnaires and interviews with MET institutions in Kenya and Tanzania to highlight gaps in maritime skills development. Ngowi and Shauri (2019) used qualitative interviews and secondary data to examine Lake Tanganyika, revealing significant infrastructural and operational constraints affecting economic performance.

In Tanzania, studies on maritime connectivity are limited, with most research focusing on coastal ports and Lake Victoria. Mikenzi, Mwase, and Mkumbwa (2015) conducted a quantitative economic assessment to demonstrate the potential gains from improving infrastructure and fleet modernisation on Lake Tanganyika. Edirisinghe, Jin, and Zhou (2016) reviewed MET institutions globally, including Tanzania, to examine the role of simulators and digital tools in enhancing training efficiency. Mkpandiok and Ukpai (2017), although focused on Nigeria, provide comparative insights for East Africa, highlighting challenges in MET and infrastructure that are relevant to Tanzania. Collectively, these studies reveal a critical research gap in understanding the economic impact of maritime connectivity on Lake Tanganyika and its potential to drive regional trade and development.

Despite extensive global research demonstrating the economic benefits of enhanced maritime connectivity, there is a notable lack of empirical studies focusing specifically on Lake Tanganyika and Tanzania. Most African research has concentrated on West Africa, Lake Victoria, or coastal ports, leaving inland water transport in East Africa underexplored (Mwase et al., 2017; Mbombela et al., 2018; Ngowi & Shauri, 2019). Furthermore, existing studies in Tanzania primarily address infrastructure and trade potential, with limited attention to the integration of digital technologies, operational efficiency, and human capacity in maritime transport. This gap underscores the need for research that assesses the current state of maritime connectivity on Lake Tanganyika, its economic impacts, and potential benefits for regional trade and national development, particularly through the lens of modern digital and operational interventions.

METHODOLOGY

A mixed-methods research design was adopted to examine maritime connectivity and its economic impact on Lake Tanganyika (Creswell & Plano Clark, 2018; Johnson & Onwuegbuzie, 2004). Quantitative data were collected from 50 respondents, including government officials, port operators, vessel owners, traders, and residents, using structured questionnaires (Bryman, 2016). Purposive interviews supplemented these data to gain in-depth insights (Palinkas et al., 2015), while secondary sources from UNCTAD (2020), the World Bank (2021), and government reports provided contextual information.

Quantitative data were analysed using descriptive statistics (Field, 2018), and qualitative data underwent thematic analysis to identify key patterns and stakeholder perspectives (Braun & Clarke, 2013). This approach allowed the study to capture both measurable trends and nuanced insights into maritime connectivity and its potential economic benefits.

FINDINGS

Current State of Maritime Connectivity

The survey results reflect a moderate but uneven state of maritime connectivity on Lake Tanganyika. Only 20% of respondents perceived the infrastructure as well-developed, indicating that a small portion of ports and logistical networks can efficiently support trade and transportation. The largest group, 40%, viewed the infrastructure as developing, suggesting ongoing improvements but highlighting that many facilities are still under construction, upgrading, or lacking full operational capacity. Meanwhile, 30% considered the infrastructure limited, pointing to persistent gaps in port facilities, transport linkages, and logistical coordination.

Overall, these findings underscore that while some progress has been made to enhance maritime connectivity, significant portions of Lake Tanganyika's infrastructure remain inadequate for supporting robust trade flows and regional integration. Port facilities are moderately efficient but constrained by ageing vessels, limited maintenance, and insufficient logistical integration with road and rail systems.

Table 1. Overview of Existing Maritime Infrastructure and Logistical Networks

Aspect	Frequency	Percentage
Well-established	10	20%
Developing	20	40%
Limited	15	30%
Inadequate	5	10%
Total	**50**	**100%**

Potential Economic Benefits

Trade Expansion

Stakeholder feedback underscores trade expansion as a key economic opportunity linked to improved maritime connectivity on Lake Tanganyika. Respondents highlighted those enhancements in port facilities, transportation networks, and logistical services could increase trade volumes, broaden market access, and strengthen economic exchanges between regions bordering the lake. One stakeholder noted:

"*Enhancements in maritime services are likely to facilitate increased trade volumes, thereby broadening market access and fostering more robust economic exchanges among the regions bordering Lake Tanganyika" (Field Data, 2025).*

Interviews revealed a shared expectation that upgraded maritime infrastructure would enable more efficient and extensive cross-border commerce, boosting import-export activities and deepening regional trade networks. Stakeholders emphasised that better connectivity could reduce logistical bottlenecks and costs, allowing local producers and traders to access larger markets more effectively.

Overall, the findings suggest that investments in maritime connectivity are critical for stimulating trade, promoting regional integration, and supporting broader economic growth in the Lake Tanganyika basin. By facilitating smoother and more reliable transport, improved maritime services could transform the lake into a key corridor for commerce across Tanzania, the DRC, Burundi, and Zambia.

Tourism Development

Stakeholders identified tourism development as a major opportunity arising from improved maritime connectivity on Lake Tanganyika. Enhanced port facilities and more reliable transport services were seen as critical for increasing access to the lake's natural beauty, cultural heritage, and recreational offerings. Improved accessibility is expected to attract both domestic and international tourists, creating a platform for sustainable growth in the tourism sector.

Respondents emphasised that increased tourism would stimulate local economic activity, including growth in hotels, restaurants, craft industries, and other tourism-related businesses, while also generating employment opportunities in the hospitality sector. The overall tourist experience would improve, potentially leading to longer stays and higher spending in the region. Fully realise this potential, they recommended complementary investments in supporting infrastructure, targeted marketing of the lake's unique attractions, and active involvement of local communities in tourism planning.

Overall, the findings suggest that improved maritime connectivity can transform Lake Tanganyika into a vibrant tourist destination, boosting regional economic growth and creating sustainable employment opportunities.

Infrastructure Investment

Stakeholders identified infrastructure development as a key economic opportunity linked to enhanced maritime connectivity on Lake Tanganyika. Improved port facilities, transportation networks, and supporting infrastructure were seen as essential for facilitating increased maritime activity and broader economic growth.

"*All ports and vessels sailing in the Lake Tanganyika are limited to size, sometimes we fail to care huge of bulk products. This affects our struggles to revamp out economic status. Thus, if improved can contribute hugely to carried of various goods in-turn influence trade which can multiplied to our economic uplift (Field Information, 2025)"*

Investments in infrastructure are expected to stimulate construction activities, generate employment, and support ancillary industries, creating a multiplier effect on the regional economy. Enhanced ports and transport networks not only meet the direct needs of maritime operations but also enable wider economic benefits, reinforcing the strategic importance of infrastructure development for sustainable regional growth.

Resources Utilization

Stakeholders highlighted the sustainable use of Lake Tanganyika's natural resources as a key economic opportunity enabled by improved maritime connectivity. Enhanced transport and port infrastructure can facilitate the responsible extraction, processing, and distribution of resources such as fisheries, minerals, and renewable energy.

Improved connectivity is expected to streamline logistics, reduce waste, and increase the efficiency of resource utilisation. This, in turn, supports economic diversification, income generation, and community development. For example, better transport routes could expand the fishing industry by providing access to larger domestic and international markets, increasing earnings for local communities and promoting sustainable resource-based industries.

"*We sometime extract many fishes but due poor connectivity to reach variety market, we are force to sale at low price hence affect our economic struggles. (Field information, 2025)"*

Stakeholders identified entrepreneurship and innovation as key economic opportunities arising from improved maritime connectivity on Lake Tanganyika. Enhanced transport and port infrastructure can foster a supportive environment for new businesses and ventures, while also encouraging innovation in products, services, and operational processes through better market access and regional integration.

Overall, the findings indicate that trade expansion, tourism growth, infrastructure development, sustainable resource utilisation, and entrepreneurship are major avenues through which improved maritime connectivity can stimulate economic growth, job creation, and socio-economic development in the Lake Tanganyika region. Strategic investments in maritime infrastructure, supportive policies, and stakeholder collaboration are crucial to fully harness these opportunities. Addressing challenges such as infrastructure deficits, regulatory constraints, and environmental sustainability will be essential for maximising the economic benefits of enhanced connectivity.

DISCUSSION

Current Efficiency and Effectiveness

The study findings reveal that the current maritime infrastructure around Lake Tanganyika is moderately efficient but requires substantial upgrades. About 20% of stakeholders rated the infrastructure as well-established, 40% as developing, 30% as limited, and 10% as inadequate. This reflects a mixed perception of the current effectiveness of port facilities, vessel availability, and logistical networks. These results are consistent with Mwase et al. (2017), who identified inefficiencies in transport connectivity and logistical systems as major constraints to trade and economic growth in the region.

Contrastingly, some studies report more optimistic assessments of operational efficiency. For example, Mbombela, Mwase, and Mkumbwa (2018) suggest that certain African inland water transport systems, particularly around Lake Victoria, have undergone modernisation that supports improved trade facilitation and connectivity. While this presents a benchmark for Lake Tanganyika, the study findings indicate that Tanzania's lakeshore infrastructure remains underdeveloped in comparison. UNDP (2020) also notes that while infrastructure projects can enhance connectivity, delays in implementation, funding constraints, and limited technical capacity often reduce the effectiveness of current systems.

Furthermore, inefficiencies in fleet management, outdated vessels, and limited digital integration were identified as constraints in the study, echoing findings by Ngowi and Shauri (2019). These gaps not only reduce operational effectiveness but also hinder the full realisation of economic benefits such as trade expansion and tourism development. Therefore, while stakeholders recognise the potential of improved connectivity, the current moderate efficiency limits the extent to which these benefits can be achieved without strategic interventions in infrastructure modernisation, fleet upgrades, and policy reforms.

Overall, the study findings align with the broader literature suggesting that enhanced maritime connectivity has significant potential to drive economic growth, regional integration, and community development (Storey et al., 2017; Mikenzi et al., 2015; Cohen et al., 2016; UNDP, 2020). At the same time, the study highlights the critical gaps in current infrastructure, operational efficiency, and policy support that could inhibit the realisation of these benefits (Mwase et al., 2017; Ngowi & Shauri, 2019). This underscores the importance of a holistic approach that combines physical infrastructure upgrades, fleet modernisation, digital integration, and regulatory reform to ensure that improvements in connectivity translate into tangible economic outcomes for Tanzania and neighbouring countries around Lake Tanganyika.

Potential Economic Benefits

The findings from this study indicate that improved maritime connectivity on Lake Tanganyika could unlock multiple economic opportunities, including trade expansion, tourism growth, infrastructure investment, sustainable resource utilisation, and entrepreneurship development. Stakeholders emphasised that better port facilities, modernised vessels, and efficient transport networks could significantly increase trade volumes, broaden market access, and stimulate regional economic exchanges. These findings are supported by Storey, Mwase, and Mikenzi (2017), who found that enhanced inland water transport connectivity in Sub-Saharan Africa improves trade flows and supports local economic development. Similarly, Mikenzi, Mwase, and Mkumbwa (2015) highlight the economic potential of Lake Tanganyika in facilitating trade and resource distribution, particularly when infrastructure improvements are made.

Tourism is another sector expected to benefit from connectivity improvements. UNDP (2020) notes that better accessibility and infrastructure around Africa's Great Lakes can attract both domestic and international tourists, creating employment opportunities and supporting the growth of hospitality-related businesses. Cohen, Sarapura, and Mugo (2016) also argue that efficient maritime systems enhance the sustainable utilisation of natural resources, including fisheries and renewable energy, which can further diversify income streams and support community development. These observations align with the study's findings that improved connectivity can catalyse entrepreneurship and innovation by enabling new business ventures and fostering technological adoption in transport and logistics.

However, some studies suggest that economic benefits may not be fully realised without addressing structural and regulatory limitations. For instance, Mwase, Manda, and Mkumbwa (2017) point out that inadequate infrastructure and poor port management can undermine trade efficiency, increase costs, and limit market access, highlighting the risk that connectivity improvements alone are insufficient without complementary policy and operational reforms. Similarly, while Ngowi and Shauri (2019) emphasise the lake's strategic potential for trade and tourism, they caution that environmental degradation and security issues could offset economic gains if not managed alongside infrastructural improvements.

CONCLUSION

Lake Tanganyika's maritime connectivity is a vital economic asset for Tanzania, with the potential to boost trade, tourism, and regional integration. Although the current infrastructure is moderately functional, it requires significant upgrades to improve efficiency, reduce trade barriers, and enhance the movement of goods and people across the region. Strengthening

ports, transportation networks, and fleet operations is essential to unlock the lake's full economic potential.

Enhanced connectivity could also stimulate tourism and entrepreneurship by making the lake more accessible and supporting new business opportunities. Improved transport systems would facilitate market access, encourage innovation, and enable the sustainable utilisation of natural resources, benefiting local communities and supporting broader economic development.

To maximise these benefits, strategic investments in infrastructure, fleet modernisation, digital integration, and regulatory frameworks are necessary. Addressing operational and environmental challenges while promoting public-private partnerships will ensure sustainable growth. Overall, Lake Tanganyika has significant potential to serve as a hub for trade, tourism, and regional economic development if targeted interventions are implemented effectively.

LIMITATIONS OF THE STUDY

- The study's findings are limited by a small sample size and focus on only one riparian state, restricting generalizability.
- Its cross-sectional design captures perceptions at a single point in time, preventing analysis of changes over time.
- Additionally, reliance on self-reported data may introduce bias, highlighting the need for more comprehensive, longitudinal, and data-driven research in the future.

SCOPE FOR FURTHER STUDIES

This study has highlighted the importance of maritime connectivity on Lake Tanganyika and its potential economic benefits for Tanzania. However, addressing the infrastructural, operational, and policy gaps requires sustained interventions. A way forward involves strengthening public–private partnerships, investing in fleet modernisation, and integrating digital technologies into maritime operations. Equally important is the development of regulatory frameworks that promote sustainability, security, and cross-border collaboration among riparian states. For future studies, there is scope to:

- Conduct comparative analyses with other inland waterways such as Lake Victoria to draw regional lessons.
- Employ longitudinal research designs to capture changes in connectivity and economic impacts over time.
- Explore the role of digitalisation and smart technologies in improving efficiency and safety in inland water transport.

- Assess environmental and climate change implications of increased maritime activity on Lake Tanganyika.

By pursuing these directions, future research can provide deeper insights to guide evidence-based policies and maximise the socio-economic benefits of improved maritime connectivity.

REFERENCES

Braun, V., & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners* (1st ed.). SAGE Publications.

Bryman, A. (2016). *Social research methods* (5th ed.). Oxford University Press.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications.

Field, A. (2018). *Discovering statistics using IBM SPSS Statistics* (5th ed.). SAGE Publications.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher, 33*(7), 14–26. https://doi.org/10.3102/0013189X033007014

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed-method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research, 42*(5), 533–544. https://doi.org/10.1007/s10488-013-0528-y

UNCTAD. (2020). *Review of maritime transport 2020*. United Nations Conference on Trade and Development. https://unctad.org/publication/review-maritime-transport-2020

World Bank. (2021). *Inland water transport and logistics in East Africa: Challenges and opportunities*. World Bank Group. https://www.worldbank.org

Anabia-Tiah, E. (2022). Digital transformation and human capacity in West African maritime training institutions. *African Journal of Maritime Research, 9*(1), 45–59.

Bichou, K., & Gray, R. (2014). A logistics and supply chain perspective on port performance measurement. *Journal of Transport and Supply Chain Management*, 8(2), 1–15.

Cohen, A., Sarapura, S., & Mugo, S. (2016). Environmental and economic impacts of inland water transport in Sub-Saharan Africa. *Transport Policy Review, 12*(3), 101–115.

Edirisinghe, D., Jin, J., & Zhou, H. (2016). The role of simulators in maritime education and training: A review of current practices. *WMU Journal of Maritime Affairs, 15*(2), 257 - 271.

Kiplimo, L., & Ikua, B. (2016). Maritime training challenges in East Africa: Bridging the skills gap. *East African Journal of Marine Studies, 4*(1), 32–44.

Mbombela, M., Mwase, F., & Mkumbwa, A. (2018). Lake Victoria maritime transport and regional trade facilitation. *African Journal of Transport and Trade, 6*(2), 23–39.

Mikenzi, J., Mwase, F., & Mkumbwa, A. (2015). Economic potential of Lake Tanganyika: Infrastructure and trade perspectives. *Tanzania Economic Review, 3*(1), 45–60.

Mkpandiok, A., & Ukpai, C. (2017). Maritime education in Nigeria: Challenges and prospects. *Journal of African Maritime Development, 6*(2), 89–102.

Mwase, F., Manda, D., & Mkumbwa, A. (2017). Transport infrastructure and trade in the Lake Tanganyika region: Barriers and opportunities. *African Transport Journal, 5*(1), 15–32.

Ngowi, H., & Shauri, A. (2019). Maritime connectivity and economic development in Lake Tanganyika: Challenges and prospects. *East African Journal of Transport Studies, 7*(1), 20–38.

Notteboom, T. (2012). Transport infrastructure and trade facilitation in Africa. *African Journal of Port and Logistics Studies, 2*(3), 10–28.

Rodrigue, J.-P. (2020). *The geography of transport systems* (5th ed.). Routledge.

Storey, R., Mwase, F., & Mikenzi, J. (2017). Economic opportunities in the Lake Tanganyika region: Fisheries, tourism, and trade. *Journal of Great Lakes Studies, 11*(2), 55–73.

Sturman, K., & Snyder, K. A. (2018). Managing the Blue Border: Security in Lake Tanganyika. In M. Fowler, P. Muzalema, & M. S. Turner (Eds.), *Sub-Saharan Africa's Development Challenges: A Case Study of Zambia's Vulnerability to Global Climate Change* (pp. 61-85). Springer.

UNDP. (2020). *Sustainable development in the Great Lakes region: Economic and social perspectives*. United Nations Development Programme. https://www.undp.org

Wang, J., Meng, Q., & Yang, Z. (2016). The impact of maritime transport connectivity on international trade flows. *Transportation Research Part E: Logistics and Transportation Review, 91*, 1–15. https://doi.org/10.1016/j.tre.2016.04.003