



LUND
UNIVERSITY

**UNDER-UTILIZATION OF LAKE VICTORIA FOR CARGO TRANSPORTATION
BETWEEN UGANDA, KENYA AND TANZANIA**

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**NEW WELFARE SERVICES—SUSTAINABLE SERVICE DESIGN AS A DRIVER
FOR REGIONAL DEVELOPMENT**

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15TH May 2024, Entebbe

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LIST OF ABBREVIATIONS

EAC	East African Community
ISCOS	Intergovernmental Standing Committee on Shipping
UNCTAD	United Nations Conference on Trade and Development
OECD	Organisation for Economic Co-operation and Development
CCTTFA	Central Corridor Transit Transport Facilitation Agency
NCTFCA	Northern Corridor Transit and Transport Coordination Authority
URC	Uganda Railways Corporation
KPA	Kenya Ports Authority
TPA	Tanzania Ports Authority
MSCL	Marine Services Company Limited
KRC	Kenya Railways Corporation
UEPB	Uganda Export Promotion Board
TRL	Tanzania Railways Limited
MGR	Meter Gauge Railway
SGR	Standard Gauge Railway
Km	Kilo Meters
EARHC	East African Railways and Harbors Corporation
Mv	Moving Vessel
MT	Moving Tanker
PMS	Premium Motor Spirit (Petrol)
AGO	Automotive Gas Oil (Diesel)
BIK	Bulk Illuminating Kerosene
RVR	Rift Valley Railways
TEUS	20ft Equivalent Units
IMO	International Maritime Organization
KNBS	Kenya National Bureau of Statistics
GDP	Gross Domestic Product
TMA	TradeMark Africa

1: EXECUTIVE SUMMARY AND INTRODUCTION

This section gives an overview of Lake Victoria, that is currently underutilized for cargo transportation by the 3 East African states of Uganda, Kenya and Tanzania, despite the great potential of this shared water body for multimodal transport and trade opportunities.

1.1 Executive Summary

Lake Victoria, the largest lake in Africa and the second largest freshwater lake in the world by surface area, is a crucial resource for the East African countries of Uganda, Kenya, and Tanzania. Despite its vast potential for multimodal transport and trade opportunities, the lake is currently underutilized by these three countries. This essay will discuss reasons for underutilization of Lake Victoria and the recent developments and interventions that have been undertaken to revive transport on this shared water body. Furthermore, the essay will discuss how the three member states can work together to sustainably enhance transportation of cargo on the lake through development a regional strategy for;- development of infrastructure, collaboration and coordination more efficient use of resources and a unified approach towards achieving common goals; identification of infrastructure development projects that benefit all three countries, such as improving ports, harbors, and transportation networks on Lake Victoria. This will help to enhance the capacity and efficiency of cargo transport on the lake; harmonization of regulations and policies related to cargo transport on Lake Victoria, making it easier for businesses to navigate the regulatory environment and operate smoothly across borders. This will facilitate trade and boost economic growth in the region. The essay also highlights the role of gender main streaming, governance and leadership – especially on the need for shift in paradigm of the policy makers and management of the operators on the lake, understanding and managing risks, and adopting value co-creation as a sustainable business model.

There are several reasons behind the underutilization of Lake Victoria for multimodal transport and trade opportunities by Uganda, Kenya, and Tanzania. One key reason is the lack of adequate infrastructure and investment in transportation facilities on the lake, including ports, terminals, and transportation vessels. Additionally, there are regulatory and administrative challenges that hinder efficient cross-border trade on the lake, including customs procedures, tariffs, and border controls. Furthermore, there is a lack of coordination and cooperation between the three member states in utilizing the lake's transportation potential, leading to inefficiencies and missed opportunities for economic growth (Uganda Shippers Council, 2024).

In recent years, there have been several interventions to revive transport on Lake Victoria and capitalize on its multimodal transport and trade opportunities. One such intervention is the establishment of the Lake Victoria Transport Master Plan, which aims to create a coordinated and integrated transport system on the lake. Additionally, there have been investments in upgrading port facilities, expanding transportation routes, and increasing the capacity of vessels on the lake. These interventions are crucial steps towards unlocking the full potential of Lake Victoria for trade and economic development in the region. Kenya has heavily invested in the re-development of Kisumu, Tanzania has done the same for Mwanza, Kigoma and Musoma ports – the busiest on the Lake. Uganda is investing in the development of Bukasa, a tri-modal port as well as rehabilitating the already existing Portbell and Jinja piers. There have been some private investors that have also invested on the lake, by either operating private jetties, like Mahathi Infra in Kawuku, Entebbe or private vessels like Orion 2, Munanka, and many more.

To sustainably develop infrastructure on Lake Victoria, the three member states must work together in a coordinated and collaborative manner. This includes harmonizing regulations, streamlining customs procedures, and coordinating investment in transportation facilities. Furthermore, gender equity and equality must be prioritized in the development of infrastructure on the lake, ensuring that women have equal opportunities to participate in the transportation sector and benefit from economic growth. We have multiple stakeholders operating on lake from the different member states, for example; Ministry of Works and Transport, Uganda National Roads Authority, Uganda Railways Corporation and the private sector in Uganda. Kenya Ports Authority, Kenya Maritime Agency, Ministry of Works and Transport and the private sector in Kenya, then Tanzania Ports Authority, Marine Services Company Limited, Tanzania Shipping Agencies Corporation, Ministry of Transport and Private sector in Tanzania. All these need to collaborate and work together to ensure delivery of quality service.

Effective governance and strong leadership are essential for the sustainable development of infrastructure on Lake Victoria. Change management is detrimental includes transparent decision-making processes, accountability mechanisms, and stakeholder engagement. Furthermore, there must be clear guidelines and regulations in place to ensure the responsible and sustainable use of the lake's resources for transportation and trade. According to Hashim, 2013 the ultimate goal of the change management is to achieve long term sustainability for businesses. Effective Change Management provide number of positive impacts that help organizations to achieve Employee Confidence, Competitive advantage, Growth and Dynamic culture in the everchanging world (H.P. Kumarasinghe, 2021).

The three member states must also understand and manage the risks associated with transportation of cargo on Lake Victoria. This includes addressing environmental concerns, such as water pollution and ecosystem degradation, as well as social risks, such as displacement of communities and loss of livelihoods.

In order to sustainably develop infrastructure on Lake Victoria, the three member states must adopt sustainable business models that prioritize environmental and social responsibility. This includes promoting green transportation practices, investing in renewable energy sources, and supporting local communities and small businesses. By fostering a culture of sustainability in their operations, the member states can ensure the long-term viability of their transportation infrastructure on the lake. There is need for engagement of stakeholders across the board to ensure sustainable value through sustainable. The member states ought to have a paradigm shift and be proactive in a way of creating value in delivering service on the Lake as opposed to the reactionary way of doing business co-creation and capture.

Gender equity and equality play a crucial role in the operations on Lake Victoria, as they ensure that all members of society have equal access to the opportunities presented by the lake. By involving women in decision-making processes and ensuring their representation in leadership roles, the three member states can create a more inclusive and diverse workforce that is better equipped to address the challenges and opportunities presented by Lake Victoria.

Borders and boundaries on Lake Victoria play a crucial role in the revival of transport by the three member states. By harmonizing regulations, streamlining customs procedures, and promoting cross-border cooperation, the member states can facilitate efficient and seamless trade on the lake. Furthermore, addressing border disputes and conflicts will be essential for creating a conducive environment for sustainable development and cooperation on Lake Victoria.

Lake Victoria presents vast opportunities for multimodal transport and trade for Uganda, Kenya, and Tanzania. By working together in a coordinated and collaborative manner, the three member states can unlock the full potential of the lake's resources and promote economic growth in the region (ISCOS, 2024).

1.2 Introduction

East Africa is the easternmost region of the African continent, variably defined by its geography. The three East African countries share Lake Victoria which provides a huge water mass for inland transportation. Besides its socio-economic uses, Lake Victoria is the symbol of unity that the three EAC economies are striving to achieve. Waterborne commerce is a key factor in the Lake Victoria region. With increased economic integration, it is anticipated that Lake Victoria will handle higher volumes of cargo. The Lake also possesses potential for investment in fishing. Fishing is an important resource in Lake Victoria with annual earnings estimated at USD500 million. Other sectors include tourism, water and energy (Lake Victoria Basin Commission, 2011).

Transport is of increasing relevance to the development of the EAC. The availability of efficient transport services is essential for reaching world markets, strengthening global integration and attracting foreign investment. For some countries it may also contribute to the generation of income through the provision of transport services. It is a crucial determinant of production and trade patterns and consequently economic integration. In order therefore to benefit from liberalized trade opportunities, the EAC needs to improve its transport and communication infrastructure.

Participation in world trade depends increasingly on the type, quality and cost of transport services. Globally, at present, intra-company trade and trade in intermediate products is growing faster than in finished products. This trend is closely linked to improvement in transport and logistics services. With the anticipated improvements in the investment climate in East Africa, it is very possible that international companies may still design the products in their headquarters, but assembly is likely to take place in a number of countries, with imported materials and components from wherever these are provided at the best price and quality (UNCTAD, 2014).

This type of specialization is closely linked to trends in transport and logistics. It provides both opportunities and risks for EAC. The EAC states are in danger of not benefiting from the opportunities because their transport services are insufficient in the light of today's requirements concerning logistics and multimodal transport services. Traditional gravity models, which simply assume that countries that are closer to each other also trade more with each other, are insufficient to explain the dynamic nature of today's trade patterns (Lake Victoria Basin Commission, 2011). However, the new trade theory posits that countries may trade based on economies of scale and production specialization rather than

just geographical proximity. For example, countries with similar production capabilities may trade more with each other even if they are not geographically close. Firms may have market power and earn high profits in foreign markets due to the availability of efficient logistics infrastructure (Medin, 2014). However, regional trade agreements, such as the European Union or NAFTA, have shown that countries that are geographically distant can still trade extensively with each other if they have a preferential trade agreement in place. This challenges the idea that proximity is the sole determining factor of trade patterns (OECD, 2008). Similarly, with the rise of technology and globalization, countries can now easily trade with each other regardless of geographical distance. This has led to the emergence of virtual trade relationships that do not conform to traditional gravity models (UNCTAD, 2020). While traditional gravity models may still have some relevance in explaining trade patterns, they are not sufficient to fully capture the complexity of modern trade relationships. New theories and models are needed to account for factors such as economies of scale, regional trade agreements, and technological advancements that shape today's global economy, (A. M. Olyanga, et al. 2022).

Given Lake Victoria's geographic location, it is not surprising that the ports in the Lake are important trade hubs for inland trade. These ports are likely to contribute to regional trade movements, providing business with opportunities to move to high value products. Trade may also contribute to regional employment and facilitates economic development. Unfortunately, trade data on Lake Victoria is scattered and *ad hoc* in nature. The revival of the Lake Victoria transport infrastructure has the potential to generate \$60bn worth of trade annually, but currently only realises a total of \$6bn for the three countries. The development of Lake Victoria ports is the biggest project in implementing the East African Community (EAC) Inland Waterway Transport infrastructure development agreed by partner states to strategically link Uganda, Tanzania and Kenya to the Northern and Central transport corridors, (East Africa – Lake Victoria Ports, 2021).

The Tanzanian ports of Mwanza, Musoma and Bukoba are the busiest on the lake, while Kenya's Kisumu port was upgraded in 2019 in preparation for an increase in activity in 2020. Uganda is struggling to build Kampala's Bukasa port to complement services offered at Port Bell. Ugandan authorities say construction of Bukasa port continues to lag behind its peers in Kenya and Tanzania as compensation for the extra land needed drags on, while tendering for initial works on the project site has also been pushed back several times, the latest being to December 2020. Bukasa once completed, is expected to handle up to 5.2m tonnes of freight annually, and ease the movement of goods from the Tanzanian ports of Dar es Salaam and Tanga, via rail to Mwanza port (East Africa – Lake Victoria Ports, 2021).

This study is an attempt to propose some new ways through which this shared water lake body can be sustainably exploited to offer a competitive logistics alternative to the aforementioned EAC member states. Joint and deliberate development initiatives by these trade partners will ensure that; the capacity on the lake is enhanced, that is to say, more vessels will be procured, both passenger and cargo vessels, improved safety and security, improved activity in terms of transport, and many more, an aspect that will not only lead to economic development and prosperity of the EAC member states through increased trade, industrialization, manufacturing, all of which are in line the National Development Plans of the Regional economies.

1.3 Aim

The aim of this essay is to examine why this shared waterbody is not optimally used for cargo transportation between Uganda, Kenya and Tanzania.

The EAC in partnership with agencies like the Lake Victoria Basin Commission, ISCOS, CCTTFA, NCTFCA has made deliberate efforts to promote the use of this shared resource. Some of the initiatives include but not limited to; capacity building (training of marine officers, captains and ship crew), procurement of assets (wagon ferries, locomotives, wagons), development and harmonization of regulations that support sustainable operations on the Lake.

1.3 Purpose

The main purpose of this study is to analyze how best this shared water resource can be optimally utilized for cargo transportation in the EAC, clearly highlighting the capacity on the lake in terms of facilities such as rolling stock, ferries, handling facilities, human resource, and many more.

This paper will address issues of navigation along the lake, safety and security through procurement of a track and trace system, procurement of more rolling stock and wagon ferries, training of captains and marine officers as well as harmonization of policies that support sustainable operations on the Lake.

Specific objectives include:

- i. To collate the trade data on the lake for the aforementioned period
- ii. To ascertain the types of traded commodities within the lake
- iii. To establish the trend of the traded commodities and if possible, establish their origin and destination.

iv. To establish and justify the viability of investment in transport services on the lake

The presentation of this study is viewed as a pragmatic assignment to give planners a strong, data-borne foundation for policy, planning and priority setting. A firm understanding of Lake Victoria trade analysis and trends is critical in the current and future planning context for the following reasons:

- Lake Victoria port trade is integral in the EAC, and must respond and adapt to a wide range of emerging economic and logistics trends.
- Transportation systems in Lake Victoria no longer exist in isolation, but must interact with other ports, customers and concerns.
- The geographic and commercial patterns of the EAC trade are being redefined by global trade, changes in inbound logistics strategy and differences in regional economic growth.

1.4 Methodology

My study commenced in February 2024 with consultations with desk officers at Uganda Railways Corporation in Uganda, Tanzania Ports Authority, Central Corridor Transit Transport Facilitation Agency (CCTTFA) and Marine Service Company Limited in Tanzania, Kenya Ports Authority and Kenya Maritime Agency in Kenya. I also used desk research to collect and analyse relevant literature and research material. Interviews were conducted with various stakeholders in the aforementioned countries.

Interviews and consultations were conducted with representatives from selected stakeholders at different levels. The interviews were conducted with the help of semi-structured questionnaires.

Section 2: TRADE ON LAKE VICTORIA

2.1 Trade in the Lake Victoria Ports and Basin

Lake Victoria, located at the heart of East Africa, is considered one of the most important shared natural resources of the East African Community.

The Lake bestrides Kenya, Uganda and Tanzania as a symbol of their natural and lasting unity.

The Lake Victoria catchments area covers 193,000Km² in Uganda, Kenya and Tanzania as well as parts of Rwanda and Burundi.

This area, invariably described as the Lake Victoria Basin and the East African Lake Region, is the size of an average African country with a population of over 30 million and a gross economic product of USD5 billion.

2.2 Economic Importance of Lake Victoria

Lake Victoria Basin's potential lies in many areas including the opportunities for investing in fisheries, tourism, transport and communications, water and energy, agriculture, trade and industry.

Fishery, an important resource of the Lake, is one of the most prolific and productive inland fisheries in Africa.

Earnings from the Lake's fish catch in the region are at USD400 million per year or slightly over USD1 million per day (Lake Victoria Basin Commission, 2011).

Lake Victoria is the most important shared resource in the East African Community.

The management and development focus of the resources of the lake is challenging and complex because of the sharing aspects and the competing stakeholders at national and regional levels (New Vision, 2024).

The socio-economic importance of Lake Victoria to Uganda and other countries of the region arises from both the intrinsic and tangible values that this lake provides and includes:

The economic value of the hydropower from the Nile and hence Lake Victoria to Uganda and the region is immense (New Vision, 2024).

Fishery business; Lake Victoria is the largest inland water fishing sanctuary in the region.

By 2009, fish (most from Lake Victoria) was the second most important export, accounting for 6 percent of total export earnings (UEPB 2009) and contributed 2.5 percent to Gross Domestic Product (New Vision, 2024).

A reservoir of water for domestic, industrial and commercial purposes; all the water consumed in most of the urban areas within the Lake Basin is derived from this Lake and it is a constant only requiring the technology to tap it (New Vision, 2024).

Inland water transport; the lake provides the cheapest linkage for trade in within Uganda and in the region.

Unlike Kenya, and Tanzania, Uganda has not tapped fully this value of the lake; the opportunities are many (New Vision, 2024).

v. Climate modulation; the lake influences the climatic conditions in Uganda and other riparians in a manner that the region despite recent climate change effects has less variable weather, a critical dependable factor for agricultural production and associated industry in Uganda (New Vision, 2024).

Biodiversity reservoir; Lake Victoria is very rich in biodiversity and this is the single most important insurance policy for the sustainability of its natural resources.

The biodiversity combined with the scenic beauty of the lake, is one of the important contributors to increased tourist arrivals in the country and the investment in the hospitality industry.

Uganda was named by lonely planet as the best tourist destination partly because of Lake Victoria (New Vision, 2024).

Section 3: Regional Transport System Overview

As Uganda is a landlocked country, it is dependent on a strong regional transport network for the majority of its imports and exports.

Uganda is served by two (2) corridors, namely;

- i. **Northern Corridor:** The Northern Corridor connects Uganda to the port of Mombasa in Kenya and runs along the northern edge of Lake Victoria.
- ii. **Central Corridor:** The Central Corridor connects Uganda to the port of Dar es Salaam in Tanzania and runs along the southern side of Lake Victoria.

In recent years, Ugandan importers and exports have preferred the port of Mombasa over the port of Dar es Salaam, due to the relative geographic proximity of the former port (Lake Victoria Transport PPP Due Diligence, 2017).

In FY 2023, the Port of Dar es Salaam only handled between 2 – 3% of Uganda’s annual transit cargo to and from Uganda (TPA, 2023).

3.1.2 Road Network

Road remains the most important mode of transport, accommodating over 75% of cargo volumes on the Central Corridor.

The corridor’s main road stretches from Dar es Salaam port westward, splitting into multiple roads that continue through Mutukula into Uganda.

According to the Central Corridor Transport Observatory, transit times from Dar es Salaam port to the Ugandan border at Mutukula is currently approximately 4.3 days.

3.1.3 Rail Network

Rail transportation along the Central Corridor is organised by Tanzania Railways Limited (TRL).

The Central Corridor rail network is organised by Tanzania Railways Limited (TRL) and comprises over 2,700 km of meter gauge track.

The network does not directly connect to Uganda; instead, the rail network connects to the Mwanza inland port, from where cargo can be transported to Uganda by rail-wagon ferries.

The rail network used to be an important component of the Central Corridor; however, lack of investments in new infrastructure and maintenance have resulted in unreliable and inefficient services.

The demand for rail in general declines as a road network expands, as has been the case with Tanzania.

However, two factors play against the demand for rail: Unless a rail station is at the final destination or the original origin of what is being shipped, rail is inevitably multi-modal and requires goods to go through a modal shift (usually roads, or, as was the case in Mwanza, ferries).

In addition, road transport allows for considerably more flexible scheduling of the beginning of a shipment, and for better information on the progress of the shipment (The Central Corridor Transit Transport Facilitation Agency (2023) Railway Network.

3.1.3.1 Future Developments

This sub-section highlights the future developments and initiatives that are aimed at enhancing capacity on the lake also boosting trade through Lake Victoria.

The government of Tanzania is currently expanding the country's rail network with the construction of a Standard Gauge Railway (SGR) to replace the old, inefficient meter-gauge railway system.

Tanzania's SGR uses electric locomotives and has the capacity to transport passengers and cargo shipments at 160 kilometers per hour.

The SGR will link Tanzania, from the port of Dar es Salaam on the Indian Ocean to the port of Mwanza on the shore of Lake Victoria in northern Tanzania (Tanzania Invest, 2023).

The SGR consists of a network of about 2,000 km developed in six phases:

- Phase 1: Dar es Salaam -Morogoro (Km 300) – 100% complete and is currently in testing trials
- Phase 2: Morogoro-Makutupora (Km 422) – 94% complete
- Phase 3: Makutupora-Tabora (Km 294) – 96% complete
- Phase 4: Tabora-Isaka (Km 130)
- Phase 5: Isaka-Mwanza (Km 249)
- Phase 6: Tabora-Kigoma (Km 506)

The expected completion date is about 2025. Expected to reduce freight costs by 40%. Each freight train is expected to transport up to 10,000 tonnes (500 lorry loads).

3.1.4 Inland Water Ways Network

Inland waterways ports infrastructures in Central Corridor are Lake Victoria, Lake Tanganyika, Lake Kivu and Rivers within the corridor. The ports are currently undergoing significant modernization to improve the capacity to handle more cargo.

3.2 The Northern Corridor

Northern Corridor provides two connecting options from Mombasa port to Uganda and consists of; a direct highway connection from Mombasa port to Uganda and a direct rail connection from Mombasa port to Uganda (Lake Victoria Transport PPP Due Diligence, 2017). Additionally, the inland port of Kisumu can be used to transport goods to Port Bell or Jinja in Uganda.

3.2.1 Road Network

The total Northern-Corridor Road network measures over 14,000 km in length and runs across the 6 countries connected by the corridor.

According to the Northern Corridor Transit and Transport Coordination Authority (NCTTCA), based on transporter surveys between 2022 and 2023, road freight charges from Mombasa to Kampala are between USD 2,200 and USD 2,400 for a single truck move.

Additionally, truck transit time between Mombasa and Kampala range from 24 to 36 hours, as shown by 2022 and 2023 electronic data collected by the Kenya and Uganda Revenues Authorities.

3.2.2 Rail Network

The current rail network in Uganda, Kenya, and Tanzania is a crucial means of transportation for both passengers and cargo. The railway system in these countries is predominantly operated by the respective national railway companies: Uganda Railways Corporation (URC), Kenya Railways Corporation (KRC), and Tanzania Railways Corporation (TRC). In Uganda, the railway network is relatively limited compared to Kenya and Tanzania.

In recent years, the government of Uganda has made efforts to improve and expand the railway network, including the construction of new railway lines such as the Standard Gauge Railway (SGR) project.

In Kenya, the railway network is more extensive and well-developed compared to Uganda and Tanzania.

The Kenya Railways Corporation operates the main railway line, the Kenya-Uganda Railway, which connects the major cities of Nairobi, Mombasa, and Kisumu. The government of Kenya has also invested in the construction of the SGR, which is a modern and high-speed railway line that has greatly improved connectivity and efficiency in the country.

In Tanzania, the railway network is also relatively extensive and connects major cities such as Dar es Salaam, Dodoma, and Tabora.

The TRC operates several railway lines in the country, including the Central Line, TAZARA Railway, and the Tanzania-Zambia Railway.

The government of Tanzania has also shown interest in improving the railway system by investing in new infrastructure and technology.

Emerging trends in the railway system in East Africa include the adoption of modern technologies such as the use of high-speed trains, automation, and digitalization of ticketing and tracking systems.

Governments in the region are also focusing on improving railway infrastructure, expanding the network, and promoting regional integration through cross-border railway connections.

3.3 Lake Transport System

Historically, the shoreline's complex topography has played a factor in the delayed development of the road network around the lake.

Hence, marine transport on the lake, together with the rail network, played a key part on the transportation of cargo and passengers to and from the land-locked countries.

The Lake Victoria basin comprises 4 main ports: Port Bell and Jinja in Uganda; Mwanza in Tanzania; and Kisumu in Kenya.

Smaller ports include Musoma, Bukoba, and Kemono Bay in Tanzania.

Kisumu (Kenya) was established as a shipbuilding and assembly centre on the Lake before the end of the first World War, with ferries and cargo ships travelling to Uganda.

By the mid- 20th Century, the East African Railways and Harbours Corporation (EARHC) operated regular sailings from Kisumu to Port Bell in Uganda and Mwanza in Tanzania, using rail ferries that carried rail wagons loaded directly from rail tracks in the three ports.

Typical journey times were 13 hours between Port Bell (Uganda) and Kisumu (Kenya), and 19 hours between Port Bell and Mwanza (Tanzania).

Besides the cargo transport system, ferry services have been developed more recently, in order to provide a safe passage to the mainland for inhabitants of the islands on Lake Victoria.

3.3.2 Lake Ports

This section demonstrates the current situation of transport services on Lake Victoria, clearly highlighting the status of the ports on Lake Victoria.

Much of the physical infrastructure in the lake ports is currently in a dilapidated state. All the ports are based on traditional general cargo traffic except for the ports of Bell, Jinja, Kisumu and Mwanza which were initially developed for rail-wagon Ro-Ro traffic and equipped with a linkspan. Currently, the ports on Lake Victoria are being modernised and equipped with container handling equipment.

The following lake ports are briefly discussed here:

- Port Bell, Uganda
- Jinja, Uganda
- Bukasa, Uganda
- Mahathi Infra, Uganda
- Mwanza, Tanzania
- Bukoba, Tanzania
- Kemono Bay, Tanzania
- Musoma, Tanzania
- Kisumu, Kenya

1. Port Bell, Uganda

Port Bell is situated along the northern shores of Lake Victoria located at the head of the Murchison Bay, south-east of Kampala.

In the past, the port handled approximately 0.5 million tons of cargo per annum.

Although facilities for the transfer of goods have existed at Port Bell since 1901 (and between Port Bell and Kampala since the subsequent construction of a 9km long meter gauge railway line in 1931), Port Bell was constructed in the 1960's as a rail-wagon terminal, although the port also has one general cargo berth of about 85m.

The port terrain is about 0.7 ha including buildings and the pier but excluding the rail shunting yard located north west of the port.

The rail-wagon terminal was constructed on reclaimed land, and has a pier of about 85 meters long and 28 meters wide.

This pier acts as a causeway to the RoRo rail wagon link-span and the rail ferry berth with about 3.5m water depth.

The link-span has two hoisting towers (designed to raise and lower the rail link-span depending on the freeboard of the ferry and differences in water levels), guide walls, and berthing dolphins for mooring the ferries for stern loading/offloading.

The pier also has a sheet piled wall construction (length about 80m) with a reinforced concrete deck, the eastern part of which can be used for loading/offloading ships using LoLo equipment.

The head of the pier next to the rail ferry berth on the east side is currently in use to berth a floating dock (dimensions about 95m x 26m).

Port Bell has a Roll on - Roll Off (RoRo) rail wagon link-span and a general cargo berth.

Its rail infrastructure (MGR) is in poor state but still functional; however, the port has no rail accessibility, as encroachment on the connecting rail line prohibits trains from entering the port.

The road access is very poor and rather congested when the port is loading/discharging general cargoes due to the lack of proper truck waiting areas.

Additionally, the port has a direct rail connection to the Kampala main station; however, this connection is currently derelict and encroached (Uganda Railways Corporation, 2024).

2. Bukasa Inland Port

The government of Uganda planned to construct another port facility to boost the country's trade network. The development of Bukasa will ease the transportation of import items from Dar es Salaam through railways to the port of Mwanza.

Cargoes will be shipped through barges and wagons ferries to Bukasa, thus making Uganda significantly independent and meeting the nation's increasing maritime transport needs.

The objective of Bukasa Port is to improve cargo transportation to and from Uganda by providing an efficient and reliable alternative route to the seaports for Uganda.

Bukasa Port will be developed as a tri-modal port, strategically located between Kampala and Jinja, in vicinity to the Kampala Industrial & Business Park (KIBP). It will be connected both to the existing (Jinja Road & MGR) and to the planned infrastructure measures (Kampala-Jinja-Expressway & SGR) and will act as East-African cargo hub, connecting the Central and Northern Transport Corridors.

Bukasa Port will contain a Roll-On/Ro-Off Terminal (RoRo) for Cargo Truck Trailer Transport as well as Multipurpose Terminals (MPT) for the handling and storage of break bulk, dry bulk and project loads.

Bukasa Port will be developed in 3 phases:

- Phase I - Masterplan and Preparatory Works;
- Phase II - Construction of Bukasa Port, with a cargo throughput of 2.4 million tons per year handled by lake navigation (ship), port railways (rail) and road transport (road);
- Phase III - Extension of Bukasa Port to a cargo throughput of 9.5 million tons per year, handled by lake navigation (ship), port railways (rail) and road transport (road).

3. The Port of Jinja

The Jinja harbour is situated on Lake Victoria, in the south-eastern part of Uganda at a height of more than 1000 m above sea level.

The British prompted cash crop production, and cotton and tea were transported after the establishment of a pier at Jinja.

Currently, the town of Jinja is Uganda's important trade centre however the port facility is in dire need of expansion and modernization.

Many factories and industries are situated in the town, near Jinja port such as a steel mill, a copper smelting unit, plywood works, tobacco units, etc.

The finished products of these small manufacturing units are transported through the Jinja port, which is also connected to the Mombasa port through railways and roadways (S. Bhattacharjee, 2022).

4. Mahathi Fuel transportation and Storage facility

Mahathi Infra is heavily investing in infrastructure to transport oil from the Port of Kisumu to Entebbe in Uganda.

Kisumu is linked with an oil pipeline from Mombasa, which means there will be a reduction in the use of roads to transport fuel from Kenya to Uganda when this project is operationalized.

Mahathi Infra (U) Ltd is not involved in the sale of oil, but its core objective is just to transportation and storage of the oil from Kenya to Uganda.

5. Mwanza

The major ports in Lake Victoria are the Mwanza South Port and Mwanza North Port.

Both Ports are connected to road and railway in the country and neighbouring countries and have many facilities including Weighbridge, Oil tanks, Workshops and Passenger Lounge to support various operations within the Lake.

Available at: <https://www.ports.go.tz/index.php/en/ports/lake-victoria-respective-ports> (accessed 03 April 2024).

6. Bukoba, Tanzania

Bukoba port serves as the gateway to the region west of Lake Victoria and is the second largest port after Mwanza. Bukoba is the capital of Kagera Region situated on the western shore of Lake Victoria. The service is provided by MV Victoria, MSCL's largest cargo-passenger ship, which is capable of carrying 200 tonnes of cargo and 1,200 passengers. Because of the well-developed road network on the western shore of Lake Victoria, bus transport operated by the private sector is competitive between Bukoba and Mwanza (Lake Victoria Transport PPP Due Diligence, 2017).

- Berthing facilities consist of a rail wagon terminal (a link-span) with a passenger/cargo quay (the main quay).
- Reclaimed land on the southern part of the port is fronted by a sheet piled wall, providing additional berthing space (originally used as a cattle berth).
- An extension of reclaimed land, with rock armoring, on the northern side of the port has allowed the construction (in 1993) of a RoRo facility for ramped vessels at the head of the main berth.

A large passenger building is located to the north, adjacent to the fenced yard area, in which the port offices are located (Lake Victoria Transport PPP Due Diligence, 2017).

7. Musoma, Tanzania

The port of Musoma is situated in Mara Bay, a large sheltered bay bound by hilly country that characterizes the eastern shore of Lake Victoria.

The original port pier was constructed on leeward side of Musoma Point, a narrow peninsula that extends into the lake on the southern shore of the bay - now a hotel.

The existing port, constructed between 1966 and 1968, is located south east of Musoma Point, on a small headland adjacent to the town.

Port facilities, constructed on artificial land consist of a rail wagon terminal with a fixed link-span bridge, shore abutment, long and short guide walls.

All wagon ferry guide walls, passenger and general cargo berths are of steel sheet pile wall construction with a reinforced concrete deck.

Port land (covering some 3 ha.) is dominated by railway track required to load/offload and shunt rail wagons within the yard area.

Due north west of the existing port site, adjacent to Musoma Point, there are two offshore mooring dolphins for berthing tank-ships for ship to shore petroleum transfers.

There are no cargo handling facilities of any kind and throughput has steadily declined due to competition from road transport taking advantage of the paved road network linking Musoma to Kenya (via Tarime and Sirari) in the North, and Mwanza (via Bunda) in the South (Lake Victoria Transport PPP Due Diligence, 2017).

8. Kisumu, Kenya

The port of Kisumu is situated in the north-eastern corner of Lake Victoria, on the southern shore of a small sheltered bay, fronting Kenya's third largest city.

Port facilities are grouped in a wide area of land some 20 ha in size. Most of this area is occupied by dockyard facilities and rail sidings, the latter which run to the main-quay or the rail-wagon terminal located its western end.

The rail wagon terminal is constructed on artificial (reclaimed) land almost perpendicular to the main quay. It, like those developed in Mwanza, Port Bell and Jinja consists of a link-span bridge, hoisting towers, guide walls and inner and outer mooring dolphins (connected by a suspended walkway).

Additionally, the rail line connecting Kisumu has not been used for over 10 years, as RVR deemed the Kisumu rail route uneconomical (Lake Victoria Transport PPP Due Diligence Report, 2017).

3.4 Marine Cargo Services

Current Situation

Organised cargo services on the lake were initially developed by the East Africa Rail & Harbours Corporation (EARHC) by the mid 20-th Century.

After the breakup of the EARHC in 1977, the cargo services on the lake were dominated by the Marine Services Company Limited (MSCL) - formally the marine division of Tanzania Railways Limited (TRL), the Uganda Railways Corporation (URC), and the Kenya Railways Corporation (KRC).

Their rail-wagon ferries, of which the largest can carry upto 22 rail wagons (equivalent to 38 TEU), had a monopoly on the carriage of rail cargo between the three East African States.

However, under the RVR operations, the utilisation of the rail-wagon ferries declined substantially and the 25 -year concession was prematurely cancelled in 2018.

Due to the deterioration of the traditional transport system, privately owned and operated vessels have become increasingly important for the Lake transport system.

There are currently more than 20 privately operated vessels, excluding the wooden boats that are often used for transport of passenger and small cargo volumes.

The majority of cargo vessels are RoRo vessels, due to the versatility of such vessels and their complementarity to the currently dominant truck transport sector.

With an estimated total carrying capacity of over 8,000 tons, the privately-owned vessels account for approximately 80% of the organised cargo carrying capacity on the lake, as only two of the rail-wagon ferries, Mv. Umoja and Mv. Uhuru and one fuel barge, MT Kabaka Mutebi are operational (ISCOS, 2024).

3.4.2 Marine Transport Challenges and opportunities for growth

In this section, I deployed the PESTEL Model to elaborate the challenges hampering the seamless operation and optimisation of Lake Victoria for cargo transport in the EAC Region as identified from, inter alia, the following sources;

- i. Lake Victoria Transport PPP Due Diligence Report (2017)
- ii. Inland Water Transport Situational Analysis Report (2020)
- iii. The Nature of Lake Victoria Transboundary Disputes and Economic Security Management between Kenya and Uganda (2022)

- iv. Building a Reform Consensus for Integrated Corridor Development in the East African Community: Pillar 1 – A Strategy and Action Plan for Intermodal Development (2014).
- v. Stakeholder discussions

The reasons for underutilization of Lake Victoria for cargo transport are as listed below;

Political Issues:

- 1. Political instabilities in the region can affect the safety and security of cargo transport on Lake Victoria.
- 2. Corruption and bureaucratic inefficiencies in government agencies leads to delays and increased costs for cargo transport operators.

Social Issues:

- 1. Insufficient infrastructure development and investment in the region, especially by Uganda has greatly affected the efficiency and reliability of cargo transport on Lake Victoria.

The Governments of Kenya and Tanzania have invested in the Ports of Mwanza and Kisumu respectively and the Standard Gauge Railway networks to support multimodal operations.

Tanzania has invested over \$500 million in the modernization of Mwanza through; modification of Mwanza North to enhance its capacity to handle post panamax RoPax vessels, procurement of a non-intrinsic scanner, procurement of modern cargo handling equipment, and many more.

Kenya has pumped \$7m into the re-development of Kisumu but a lack of corresponding infrastructure and political will from Uganda could delay the dream of a vibrant all-round Lake Victoria economy, The East- African (2011)

However, all the three member states that share Lake Victoria have certified training institutions apart from Uganda - Bandari College in Kenya and Dar Es Salaam Maritime Institute and Bandari College in Tanzania.

Economic Issues:

- a. Fluctuations in fuel prices affect the operating costs of cargo transport on Lake Victoria.
- b. Lack of access to financial resources for infrastructure development and fleet modernization can hinder the growth of the cargo transport sector in the region. Construction/ procurement of modern and fit-for-purpose vessels,

wagon ferries and rolling stock is capital intensive and in most cases a preserve of governments. However, due to varying priorities, the levels of budget appropriation and resource allocation to the transport industry defers per country, an aspect that has hindered development of the sector.

- c. Lack of harmonization in the tariff by the operators. For example, URC and MSCL, both operating on the same route have varying tariffs for Mv Kaawa and Mv Umoja. These vessels serve the same customers, use the same facilities but have a different tariff (Uganda Shippers Council, 2024).
- d. Insufficient investment in infrastructure development at the ports and piers in the region. Port performance is essential for the efficiency and effectiveness of the maritime network. Such efficiency is driven by a wide range of factors including infrastructures within which a Port/Pier is operating (UNCTAD, 2018).

The vessel operators may still achieve an overall saving, because their vessels spend less time in the port, which in turn, will also lead to lower freight rates. However, development of port infrastructure is only worthwhile if the entire transport system benefits and not if bottlenecks are only shifted to another element within the system (TMA, 2024).

Technological Issues:

1. Limited access to modern navigation and communication technologies can impact the safety and efficiency of cargo transport on Lake Victoria. Currently, there is track and trace system on the Central Corridor, an aspect that has greatly compromised the safety and security of cargo, especially on rail from Mwanza to Dar es Salaam Port.

Eighteen (18) aids to navigation equipment have been installed in Kenya at Kisumu, Homa Bay, Mbita Ferry jet and Luanda Kotieno in Siaya County, twenty-two (22) aids in Uganda were installed in Bukata, Luku, Port Bell, Entebee and Jinja jetties and forty-six (46) in Tanzania which were installed in Musoma, Mwanza South Port, Mwanza North Port, Mwanza Mwaloni Jetties, Nansio Port, Sentry rock, Kigongoni Ferry Jetty, Kemondo bay and Bukoba Bay (Lake Victoria Basin Commission, 2023).

2. Inadequate maintenance of vessels and equipment can lead to breakdowns and disruptions in cargo transport operations. Before it was grounded in October 2023, Mv Kaawa was the only wagon ferry operating on the Portbell/Jinja-Mwanza route and had a turnaround time of 19-20 hours per voyage as opposed to the functional schedule of 12 hours. This more than often led to delays thus

affecting cargo handling operations on the Lake (URC, 2024).

Opportunities in the inland waterway sector from the technological perspective

A well-functioning maritime transportation system largely require a reliable Information and Communication Technology.

There is need for a reliable connectivity that will enable tracking of vessels, time when a cargo was loaded from point of origin up to when it will be unloaded at entry port, trucking of its movement and other requirements all need to be well and effectively connected using very reliable information systems (Uganda Shippers Council, 2024).

According to UNCTAD, 2018 - Opportunity and Growth Diagnostic of Maritime Transportation in the Eastern and Southern Africa, the economic importance of Maritime Transportation is facilitated by high level efficiency that guarantee timely submission, timely delivery, high quality services which are less bureaucratic.

Hence a reliable and well-functioning connectivity platform which enables a “HUB” of high quality, reliable and quick to retrieve information for cargo handling and processing.

Some of the important systems here include Automatic Identification Systems (AIS), Vessel Traffic Management System (VTMS) and Port Operating Systems (POS).

Such systems, when combined with a Port Community System acting as the hub, are able to offer a wide range of advantages to the transport sector in the country and the region by improving the efficiency and productivity of port operations.

Within the Eastern Africa despite observable progress in specific countries generally East Africa still faces infrastructure related challenges across different subsectors.

Hence, there are important growth opportunities in productivity-related infrastructure areas – namely, energy production, logistics and ICT.

Environmental Issues:

- a. Pollution and environmental degradation in and around Lake Victoria can affect the water quality and ecosystem health, impacting cargo transport operations. Pollutants such as plastics and disposals from homesteads has impacted the quality of navigation on the lake.

Additionally, the water hyacinth also poses a threat to navigation on the lake. According to the Lake Victoria Basin Water Board, the hyacinth not only blocks smooth flowing of water into the lake from tributaries but also limits navigation (Lake Victoria Basin Commission, 2023).

- b. Climate change-induced extreme weather events can disrupt cargo transport operations on the lake. According to Ministry of Water and Environment in Uganda, the water levels have risen to 14m, an aspect that will greatly affect transportation on the lake.

Legal Issues:

1. Inconsistent and outdated regulations governing cargo transport on Lake Victoria leads to confusion and compliance issues for operators. Operations on the lake are governed by; the Merchant Shipping Acts 2009 (as amended) and 2003 for Kenya and Tanzania. The Lake Victoria Transport Act 2007 guides marine operations in Uganda. Much as there are sufficient laws in place, there aren't sufficient regulations developed to guide all issues of inland water transport with the regulation of boats of traditional build (which are the majority on the inland waterways) is still lacking.
2. Lack of enforcement of safety and environmental regulations can pose risks to cargo transport operations and the well-being of communities around the lake. Maritime transportation requires well coordinated and integrated efforts due to the nature of water bodies that tend to overlap from one country to another.

Different trade facilitation measures can be implemented to reduce waiting times and improve the logistics performance of countries in other ways. Hence development of maritime transportation needs to consider the fact that there are inland transportation using Rail and Road which display the overlapping nature thus calling for integrated efforts. Specifically, for East African member states they have a Treaty of establishment which categorically stipulate agreement for maximum utilization of maritime resources for the sector development, (UNCTAD, 2018 - Opportunity and Growth Diagnostic of Maritime Transportation in the Eastern and Southern Africa)

In conclusion, the opportunity of increased growth to the maritime transportation is also in the form of increased volumes that can facilitate cost reduction.

The volume of cargo is important as it allows for economies of scale, both on the sea leg as well as in port, although at times the economies of scale achieved on the shipping side may lead to congestion and diseconomies of scale in the port.

Having spare capacity, carriers are willing to transport cargo at a much lower freight rate than when the ships are already full.

3.5 Trade and Market

This section provides an overview of Uganda, Kenya and Tanzania's main imports and exports amongst themselves, and further investigates the Lake Victoria transport potential of several of the country's major import and export commodities.

Uganda's economy has rebounded strongly, with all three sectors (agriculture, industry, and services) weathering recent successive shocks to push growth in gross domestic product (GDP) to 5.3% during FY23 compared to 4.7% the year before. With higher capital imports, due primarily to investments related to the country's crude oil development project, the current account deficit widened to 8.7% of GDP in FY23 up from 7.9% in FY2022 (The World Bank Group, 2024).

Although Kenya is the most industrially developed country in east Africa, the manufacturing sector only accounted for 7.2% of GDP in 2021 (KNBS Economic Survey 2022).

Major import commodities include agricultural machinery, implement and pesticides, industrial raw materials, machinery and transportation equipment, petroleum and petroleum products, construction materials, consumer goods.

The main imports are machinery and transport equipments, textiles and clothing, petroleum products.

Tanzania's major trading partners include: China, Germany, Japan, India, the European Union, United Arab Emirates, United Kingdom, Kenya, Japan, India and South Africa (Ministry of Foreign Affairs and East African Cooperation, United Republic of Tanzania, 2024).

According to UNCTAD - Opportunity and Growth Diagnostic of Maritime Transportation in the Eastern and Southern Africa (2008), development and quality of various modes (especially rail) that link to the Maritime system such as Ports and inland waterways have a direct correlation with the observed performance of Maritime Transportation.

Hence availability of efficient rail services will also be crucial factor to demand more from the economy and perhaps the maritime sector as well.

One of the major binding constraints in maritime transportation growth is availability of cargo.

There is impressive economic growth of East Africa make a strong base or justification for improvement and expansion of transportation services.

In countries like Ethiopia and Kenya industrial Parks have played a leading role in assurance of cargo availability once they are completed.

Therefore, even in the ongoing port improvement and expansion world class Industrial Parks covering major sectors such as Textile, Sugar Production, apparels, leather, pharmaceutical agro-processing such as tea, coffee, sisal need to be developed.

More efforts are also recommended to improve farming and exportation of major cash crops like sisal, coffee, cotton, tea, tobacco which are voluminous and like to increase demand for transportation services and the economy as well.

In this way Maritime Transportation projects will be assured of cargo availability and hence attain pay -back period of investment in this area.

3.6 Service Routes & Fleet

This section highlights the optimal service routes and respective fleets for the point-to-point cargo services across the Lake Victoria.

The focus for the (international) point to point cargo services across the lake is on the trade lanes between (i) Port Bell and Mwanza; (ii) Port Bell and Kisumu; (iii) Jinja and Mwanza; and (iv) Jinja and Kisumu.

Transport Options

For the envisioned point to point cargo services across the lake, the following transport options have been identified:

- **Rehabilitation of the rail ferry facilities:** This involves rehabilitating the existing facilities to load rail wagons onto ferries. It does not involve significant new infrastructure projects.

Infrastructure in the form of jetties and piers is often very basic and in dilapidated condition and require rehabilitation. Access from both the land and water sides is often poor, and on the lakes and rivers sometimes obstructed by growths of water hyacinth, which has infested the Lake Victoria (National Integrated Transport Master Plan 2021-2040).

In the recent past, there has been rehabilitation of wagon ferries and facilities as a way to enhance capacity on the Lake. Mv. Umoja had been grounded since 2021 for rehabilitation, however, in October 2023, the ferry resumed operations on the Mwanza – Portbell- Jinja – Kisumu route, adding over 100,000 MT of cargo on Lake Victoria per annum (MSCL, 2023).

CCTTFA, a major stakeholder along the central corridor has rehabilitated 40 flatbed wagons to enhance the capacity along the corridor. 20 of these, belonging to URC were commissioned in October, 2023 and these wagons will enhance Uganda Railways Corporation's capacity to transport our customer's cargo, thereby increasing efficiency, reliability, competitiveness and increased volumes along the Central Corridor. This move is pivotal in making the Central Corridor the Competitive and Sustainable Trade Route of Choice for importers and exporters in Uganda, CCTTFA, (2024) CCTTFA commissions 20 wagons to Uganda Railways Corporation. Available at <https://centralcorridor-ttfa.org/ccttfa-commissions-20-wagons-to-uganda-railways-corporation/> (Accessed 15 April 2024).

Additionally, URC is undertaking a couple of initiatives, under the African Development Bank project to enhance capacity on the lake, some of which include;

- i. Retrofitting of MV Kaawa
 - ii. Rehabilitation of a Floating Dry Dock
 - iii. Procurement of four (4) New Mainline Locomotive (Power 3000 HP) to support local shunting
 - iv. Procurement of One Hundred (100) Wagons - Flat beds (with Collapsible Saddles)
 - v. Procurement of twenty - four (24) cryogenic 40ft ISO Tanks for transportation of Liquefied Petroleum Gas (LPG) across the lake
- **Procurement of Lift on – Lift off (LoLo) barges and LoLo cargo vessels:** This will necessitate the construction of an appropriately-sized quay with adequate draft to allow vessels to berth alongside while being loaded by means of a crane. (Lake Victoria Transport PPP Due Diligence Report, 2017).

Ministry of works and Transport and URC are in plans to procure modern ferries (LoLo) barges to boost container traffic on the Lake. These will use both Portbell and Bukasa ports in Uganda and Mwanza and Kisumu in Kenya (URC, 2024).

Tanzania Ports Authority has invested in modern equipment at Mwanza Port such as portal crane, forklift, mobile crane, dredger, tug linder, modern weighbridge as a way of enhancing capacity of the Port to handle containerised cargo on LoLo barges, (TPA, 2024).

- **Roll on – Roll off (RoRo) barges using RoRo trailers and vessels:** This involves having a storage area in the port from where the cargo can be loaded onto a trailer by crane.

On 22 February, 2024 Mv. Mpungu, an East Africa Marine Transport (EAMT) vessel was launched on Lake Victoria. M.V. Mpungu, a 96-metre-long vessel with capacity to handle up to 21 trailers (1,000 tons of containerised cargo) per voyage will be Lake Victoria's first

scheduled roll on / roll off freight vessel, InfraCo Africa (2024) Pioneering East Africa Marine Transport vessel launches on Lake Victoria. Available at <https://infracoafrica.com/pioneering-east-africa-marine-transport-vessel-launches-on-lake-victoria/> (Accessed 15 April, 2024).

Additionally, Mahathi Infra U Limited is currently operating a self-propelled barge (MT Kabaka Mutebi II) to transport petroleum products across Lake Victoria from Kisumu, Kenya to Kawuku, Uganda (Mahathi Infra U Limited, 2024).

SECTION 4: RECOMMENDATIONS AND CONCLUSION

This section highlights the recommendations and conclusion of this essay.

4.1 Recommendations

The aim of this essay is to examine why this shared waterbody is not sufficiently utilized as a viable alternative for freight movement in the East African Community. The underutilisation of Lake Victoria can be attributed to several factors, some of which include; inadequate infrastructure, insufficient investment for development of infrastructure, poor governance and management, inadequate training and skillsets, inflation in fuel prices, pollution and water hyacinth and limited cooperation among the three East African states. Additionally, the presence of borders and boundaries on the lake has created challenges for seamless transport and trade operations.

The underutilization of Lake Victoria for cargo transport can be addressed through enhanced cooperation among Uganda, Kenya, and Tanzania because it will;

- i. Improve coordination and collaboration between the three countries can lead to better infrastructure development, such as upgrading ports, better customer service and transportation facilities on Lake Victoria. In October, 2023, Mv Umoja, a vessel operated by MSCL resumed its operations between Mwanza and Portbell and Jinja piers in Uganda – facilities that are operated by URC. The two (2) entities agreed on a couple of initiatives like; joint marketing, concessions on tariffs for the link spans, concessions on use of wagons and joint tariff. The same has been extended to Mv. Uhuru.

- ii. Help in implementation of common navigational and safety standards across the three countries can improve overall safety and security of cargo transportation on Lake Victoria. This harmonization in policies and regulations regarding cargo transportation on Lake Victoria will help streamline processes and make them more efficient.

In 2002, a tripartite agreement, which provides a comprehensive framework for regulating inland waterway shipping was concluded between Uganda, Kenya and Tanzania. It harmonizes requirements relating to ship documents and registration. It imposes common safety standards related to periodic ship surveys, safe manning requirements and the provision of aids to navigation and radio communication. The Agreement adopts the important principle that states should mutually recognize each other's registration, survey and safe manning certificates. The Agreement further commits the states to apply the IMO's rules on the prevention of collisions and to adopt common rules on conducting search and rescue

37 operations. It also contains a commitment to harmonize rules on the prevention of marine pollution. The Agreement adopts several common principles governing the liability of carrier for loss or damage to goods and liability for personal injury and death arising out of the conveyance of passengers, *Vasudave, D (2011) Field study of aid delivery mechanisms directed to reduce transport costs and non-tariff barriers for exporters. ON, Canada: Centre for socio-economic development.*

- iii. Promote information sharing and communication between the three countries can lead to better coordination of cargo transportation schedules and routes. This can be done through deployment of ICT infrastructure like a modern track and trace system to ensure visibility on the operations on the Lake. Information should be shared amongst all the stakeholders, that is; from the policy makers to the customers as this will enable us establish and maintain value co-creation, a sustainable business model that will help improve trade on the lake. By involving customers in the service creation process, operators can better understand their needs and preferences. This allows operators to tailor their services to meet customer demands, ultimately leading to higher satisfaction and loyalty. The maritime logistics value model admits that the value-creation process starts with shippers (Lee and Song, 2010). Collaboration with customers can help operators identify areas for improvement in their service offerings. By working together to address these issues, operators can enhance the quality of their services, leading to a better overall customer experience. A network-infused perspective on strategy suggests that it is especially important for maritime logistics network actors to build and maintain relationships and coevolve with the resources accessed through these relationships (Gadde et al., 2003). To comprehend the value of resources, these must be viewed from a hierarchical perspective, including tangible resources as well as knowledge and skills (Madhavaram and Hunt, 2008). Shipping companies must adopt integrated marketing strategies that focus on value creation, communication and delivery (Chen et al., 2017)
- iv. Help in the development of a regional strategy for enhancing cargo transportation on Lake Victoria can help align efforts and resources towards common goals and objectives. The LVBC is currently implementing the 4th LVBC strategic plan (2021-26), whose objectives are to; enhance environmental and natural resources management; promote integrated water resources management in LVB; enhance maritime transport safety and security on Lake Victoria; strengthen social development services in LVB; promote economic investment and enhance blue

economy potentials in LVB, and strengthen the institutional and coordination capacity of the LVBC Secretariat and Partner States (LVBC, 2022). However, this strategy is silent on issues pertaining to asset (wagons, locomotives, ferries, linkspans) sharing which are key for sustainable service on the Lake. A regional strategy will facilitate coordination among the three countries, ensuring that efforts are aligned and duplicative efforts are avoided. This will lead to more efficient use of resources and a unified approach towards achieving common goals. Absence of modern vessels, railway connections and cargo handling facilities at ports continue to hamper efforts to revive trade and transport on Lake Victoria between Kenya, Tanzania and Uganda (The East African, 2018), however the three states of Uganda, Kenya and Tanzania seem to lack harmony in the implementation of joint infrastructure projects that facilitate cargo movement, for example, Kenya and Tanzania has constructed the SGR from the Ports of Mombasa and Dar es Salaam to Naivasha and Mwanza respectively, however, Uganda is yet to start on this project, yet it is key in enhancing efficiency in movement of cargo through Lake Victoria. On a more positive note, all nations are working towards constructing and modifying already existing Ports for example, Bukasa in Uganda, Kisumu in Kenya and Mwanza in Tanzania. If these initiatives get complete at the same time, there will be an increase in cargo transport on the Lake (MoWT, 2024).

- v. Ensure joint training and capacity building activities for stakeholders involved in cargo transportation on Lake Victoria can help improve skills and knowledge in the sector. This will help on issues of gender mainstreaming, how best to address emerging trends in the industry, market surveys and also equip staff with requisite competences to professionally undertake their assignments. There is need to address the issue of inclusion and gender mainstreaming in their capacity building initiatives. First, the policy makers ought to make policies that make the work of female employees on transport systems along the inland waterways safe and convenient. Applying these guidelines may require hands-on training and discussions between public transport authorities, government policymakers, and community groups to adapt them to different socio-cultural contexts, (ESCAP, 2021).

Additionally, women should be empowered with a technical skillset that gives them the requisite competences to operate in more operational and managerial roles, not just as chefs and laundry personnel on vessels. While women still only comprise two percent of the 1.2 million seafarers worldwide, it's no longer virtually impossible for them to enter the industry (MITAS, 2022). Women should be employed as captains, operations managers, navigators on the vessels and ferries along L. Victoria.

Promoting equality or, recognizing or accepting diversity, is assumed to be good for business. This is a different kind of rationale from that employed in an appeal to considerations of justice and fairness (Hutchings and Thomas, 2005; Mayes and Pini, 2014). World over, Women are beginning to be distributed in organizational class structures in ways that are similar to the distribution of men (Acker 1990, 1992).

4.2 Conclusion

The areas around the lake are very much interlinked and trading is very intensive. Goods that are traded across the Lake reflect its diversity in economic activities such as fishing, industries, agriculture among others. The transport system, processes and infrastructure make trade to flourish (Lake Victoria Basin Commission, 2011).

I established that for Kenya, Kisumu is a very important port for intra-regional trade, because it connects with North Western Tanzania, Uganda through Jinja and Portbell piers and the jetty in Kawuku and to a lesser extent Rwanda and Burundi especially for re-export of petroleum products such as fuel oil and diesel.

For Tanzania, trade using Lake Victoria originates, is destined and transported using three ports including Mwanza, Musoma and Bukoba port. Among the three ports, Mwanza is the largest and the busiest, serving both Uganda and Kenya.

Uganda's cargo transport activities on Lake Victoria are an essential part of the country's economy. The lake serves as a major transportation route for goods, with various vessels such as Mv. Kaawa, Mv. Pamba, Mv. Umoja, Mv. Mpugu, MT. Kabaka Mutebi II and small boats carrying products to different parts of the country. Cargo transported on the Lake includes fuel products, agricultural products, construction materials, steel products, and other goods needed for trade and commerce. The efficient transportation of goods on the lake plays a significant role in facilitating trade and economic development in Uganda.

In conclusion, the under-utilization of Lake Victoria for multimodal transport and trade opportunities can be addressed through enhanced cooperation among Uganda, Kenya, and Tanzania. By promoting gender equity and mainstreaming, sustainable business models anchored on value co-creation, and effective governance, the three member states can sustainably develop the infrastructure of this shared water body and maximize its economic potential. Embracing a collaborative approach and overcoming the challenges posed by borders and boundaries on Lake Victoria are crucial steps towards creating

sustainable transport and trade activities on this vital waterway.

All the aforementioned can be achieved with an agile shift in paradigm, especially with the policy makers. There should be a change in the management of this shared water resource, not only to enhance cargo transportation but also ensure sustainability of operations. World over, shipping and related facilities such as ports are one of the biggest reasons of air pollution, global warming and the damages caused to sea life (Dinwoodie et al., 2012) therefore, the policy makers from the 3 states should ensure that operators on the Lake have sustainable operations.

According to (Sinakou et al. 2017), sustainability can be described by 3 factors of environment, cost effective or economy and social acceptance and is a new trend that aims to help many industries, including port and shipping industry, reduce its contribution to pollution and global warming and balancing between the economy and social goals. Change management at policy and operational levels can be ensured through; comprehensive engagement of all relevant stakeholders, including government agencies (TPA, MSCL, KPA, URC, TRC, TRA, URA, KRA) transport companies (Mv Mpungu, Mnanka, Upendo, Orion 2), and local communities, in the change management process. This will ensure that their needs and concerns are taken into consideration during the implementation of any changes. Engaging stakeholders helps ensure their adoption and utilization of new processes, systems, or tools. By involving stakeholders in the design and implementation phases, their needs and preferences can be addressed, enhancing proficiency and minimizing resistance (E. Luger, 2023).

Training and capacity building is yet another way through with the 3 states can ensure successful change management. All operators face major transformation challenges, whether they work in fierce competition or enjoy a monopoly position, and whether their market is mature or still developing. The success of any business depends on their adaptability and, most important, their ability to capitalize on their prime asset - their human resources (sofrecom, 2013). Employees should be empowered with a skillset that ensures that they all supplement to the business development and management needs of the organizations that operate on the lake. A joint EAC curriculum, fully accredited by IMO is being implemented by Bandhari college, an aspect that has enabled the institute train highly competent sea-fearers in different disciplines (KPA, 2024) an aspect that has enhanced safety and security on the lake, hence sustainable operations.

5. ANNEX 1 – LIST OF TABLES

Table 1: Area of Lake Victoria basin in East African countries

Country	Lake surface area		Catchment area		Lake shoreline	
	Km2	%	Km2	%	Km2	%
Tanzania	33,756	49	79,570	44	1150	33
Uganda	31,001	45	28,857	15.9	1750	50
Kenya	4,113	6	38,913	21.5	550	17
Rwanda			20,550	11.4		
Burundi			13,060	7.2		
Total	68,870		180,950		3,450	

Table 2: Uganda's imports through the Port of Dar es Salaam in 2023

ITEM	UNIT	VOLUME
Liquid bulk	Metric tons	106,099
Dry Cargo	Metric tons	7,706
Container Cargo	Metric tons	4,017
Dry cargo (rail & road)	Metric tons	5,900
Container (rail & road)	Metric tons	3,782

Source: TPA

Table 3: Mahathi Infra holding capacity

Product	Tanks	Tank Cap. M3	Total Cap. M3
Diesel	3	9,000	27,000
Gasoline	3	9,000	27,000
Jet A1	4	2,000	8,000
Kerosene	4	2,000	8,000

Source: Mahathi Infra

Table 4: Government owned cargo vessels operating on Lake Victoria

Ferry	Owner	Operational Status	Capacity (MT)
Mv Pamba	URC	Grounded	880 – 1,200
Mv Kaawa	URC	Grounded	880 – 1,200

Mv Umoja	MSCL	Operational	880 – 1,200
Mv Uhuru	KRC	Operational	880 – 1,200

Source (URC, KRC, MSCL, 2024)

Table 5: Private vessels operating on Lake Victoria




Operator	Vessel	Flag	Capacity (MT)
Moil	Allez	Kenya	400
Bilaport	Bilaport	Kenya	300
Matata	Kivila Matata	Kenya	200
KFL	Thor	Tanzania	270
	Orion 2	Tanzania	500
Salma	Salma 1	Tanzania	280
	Salma 2	Tanzania	280
	Salma 3	Tanzania	400
Vero shipping	Vero	Tanzania	400
African Minerals	Indi	Uganda	200
	Jack	Uganda	200
LVMS	Satnam	Kenya	400
	Sahiji	Kenya	280
Tricon	Tanker 1	Kenya	300
	Tanker 2	Kenya	300
Mkombozi	Chacha	Tanzania	600
	Kamongo	Tanzania	220
	Munanka	Tanzania	600
	Nyangi	Tanzania	350
	Wankyo	Tanzania	400
	Kirumba	Tanzania	300
	Matara	Tanzania	300
Mugendi	Tanzania	300	
Mahathi Infa	MT Kabaka Mutebi II	Uganda	4,500
Grindrod Logistics U Ltd	Mv Mpungu	Uganda	880
Total			1,3160






Source (ISCOS, 2024)

Table 6: An overview of the developments in these sectors, and their impact on the potential Lake Victoria volumes.

• Development	Lake Victoria Transport Impact	Impact
Mining		
<p>Mining sector in the region is growing rapidly.</p> <p>The mining industry is booming, with minerals like diamonds, coal, and gold contributing to a rapid increase in export income (Grant Thornton, 2023).</p>	<p>Increased transport of inputs and outputs</p>	+
<p>Majority of natural resources are in Uganda’s western, Eastern and Northern regions, which connect to Lake Victoria through the Metre Gauge Railway</p>	<p>Lake Victoria is conveniently situated to connect the mines in Uganda to Mombasa (Kenya) or Dar es Salaam (Tanzania).</p> <p>The Metre Gauge Railway (MGR) is currently being rehabilitated to connect Malaba and Tororo to Jinja Pier and Port of Mombasa. The local industrial regions in Western Uganda will also be connected to Lake Victoria through the Kampala – Kasese MGR network</p>	+
<p>Overall Lake Victoria transport potential</p>	<p>With improved connectivity through the rehabilitation of the MGR, piers at Portbell and Jinja, it is expected that transport on the Lake for mineral resources will exponentially increase. Currently, over - 10,000MT of tiles, 8,000 MT of iron sheets is transported from Jinja/Portbell to Mwanza through Lake Victoria.</p> <p>On the import side, coal, billets, coils are imported from Mwanza, Dar es Salaam and Mombasa.</p>	+
Oil & Gas		
<p>Development of refining capacity in Uganda</p>	<p>Government of Uganda plans to develop a 60,000 barrels of oil per day refinery at Kabaale, Buseruka Sub-County in Hoima District. This 211 km long</p>	-

	<p>multi-products pipeline will evacuate refined products from the refinery to a storage terminal at Namwabula, Mpigi District (UNOC, 2024).</p> <p>Uganda refining her own Oil & gas resources means that there will be a reduction in imports of petroleum products.</p>	
Development phase of oil and gas fields in the Albertine Graben	<p>Project cargo often provides an opportunity for alternative means of transport due to its nature, OOG, and damages roads. Lake Victoria has the potential to provide a gateway for imports of Out-of-gauge cargo from the Ports of Mombasa and Dar es Salaam to the Albertine Graben. Currently, 100% of the equipment is transported on road from the Port of Mombasa, even the OOG.</p> <p>URC, TRC, TPA have the opportunity to position themselves as viable option and central corridor through Lake Victoria.</p>	+
Downstream Operations in the Oil & Gas sector	<p>Uganda imports 100% of her petroleum products through the Ports of Mombasa and Dar es Salaam. On average, Uganda imports 210 million litres and over 90% of this is transported by road.</p> <p>In the recent past, Oil Marketing Companies started importing petroleum products through Lake Victoria. The Kawuku Oil Jetty, managed by Mahathi Infra made a total of 46,000 cum of AGO and PMS in 22 voyages between December, 2022 and October, 2023 (Mahathi Infra Uganda, 2024).</p> <p>In 2020, UNOC transported 6.0 million litres of AGO from Kisumu oil jetty to the Jinja storage terminal. The lake can support up to 12 million litres of fuel for Uganda in a month (URC,2024).</p> <p>UNOC has assumed full responsibility for the importation of petroleum products, marking a</p>	+

	<p>significant shift in the nation's energy landscape, after the amendment of the Petroleum Supply (Amendment) Act, 2023 (UNOC, 2023) . In order to diversify their supply chain, a portion of this product will be imported through the Ports of Dar es Salaam and Tanga and transported through the efficient multimodal system through Mwanza. Currently, the MGR can only transport 10.5 million litres, which is equivalent to 5% of the monthly demand. The available wagon ferries (Mvs Kaawa, Umoja and Pamba) can only transport 8 million litres a month (TPA, 2024)</p>	
Overall Lake Victoria transport potential	<p>It is expected that imports of petroleum products will increase and this is a substantial opportunity for Lake Victoria transport.</p>	
Iron & Steel		
<p>Implementation of “Buy Uganda, Build Uganda”</p>	<p>Reduced steel product imports, as an increasing share of national demand can policy be satisfied through local production (Ministry of energy & Mineral Development, 2024).</p> <p>There is also a total ban on the exportation of iron ore from Uganda (Ministry of energy & Mineral Development, 2024). This negatively impacts Lake Victoria transport</p>	
<p>Increased levels of industrialisation and construction</p>	<p>Increased coal requirements to increase local steel production levels. Many of the steel manufacturers are situated close to Kampala or Jinja, the inputs can be efficiently transport over Lake Victoria.</p> <p>On the other hand, the outputs, especially construction material, confectionary, form, etc are transported to Tanzania and Kenya over Lake Victoria.</p>	

Overall Lake Victoria transport potential	It is expected that potential Lake Victoria transport volumes resulting from the growth of the manufacturing, construction and industrialization in the will grow substantially, due to the deliberate and intentional initiatives undertaken by URC, KPA, TPA to market the lake-rail leg as a viable option for volume importers.	
Transit Containers		
Development of the SGR between Mombasa and Kampala	The ongoing SGR development may undermine the competitive position of the Kampala Lake Victoria route once the connection between Mombasa and Kampala is completed.	
Rapid growth of transit container volumes from/to Uganda	Lake Victoria is conveniently situated to accommodate the growing transit Uganda container volumes between Mombasa/Dar es Salaam and Uganda, as Uganda's main consumption/production centres are located along the shores of the lake.	
Development of the Lake Victoria transport	The envisioned improvements to the Lake Victoria transport system will enable system cost-efficient transport of the transit containers, thus improving the competitiveness of lake transport vis-à-vis road and rail. This will be achieved through; modernization of the Lake Ports (Mwanza, Kisumu, Jinja and Portbell), investment in rolling stock and wagon ferries, establishment of modern ports like Bukasa, and many more.	
Overall Lake Victoria transport potential	The substantial volumes and rapid growth of transit container flows provide a large opportunity for the lake transport system. However, it should be noted that market share for lake transport will likely	

	decrease substantially once a direct SGR connection between Mombasa and Kampala is in place.	
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Source: Stakeholder consultations

Table 7: Volume of cargo transported through Lake Victoria by Mv. Kaawa (July, 2022 – June, 2023).

MONTH	IMPORTS NORTHERN	EXPORTS NORTHERN	IMPORTS CENTRAL	EXPORTS CENTRAL	DELIVERED (TONS)
Jul-22	16,064.00	914.00	2,658.00	2,870.00	22,506.00
Aug-22	14,304.00	115.00	3,670.00	2,298.00	20,387.00
Sep-22	15,322.00	40.00	3,548.00	2,549.00	21,459.00
Oct-22	13,392.00	1,255.00	892.00	1,154.00	16,693.00
Nov-22	15,682.00	1,363.00	1,346.00	2,775.00	21,166.00
Dec-22	17,652.00	1,766.00	880.00	1,817.00	22,115.00
Jan-23	18,398.00	1,108.00	760.00	2,840.00	23,106.00
Feb-23	13,175.00	229.00	1,240.00	1,841.00	16,485.00
Mar-23	688.00	486.00	1,560.00	4,499	7,233.00
Apr-23	10,771.00	1,211.00	1,124.00	898	14,004.00
May-23	16,893.00	1,154.00	1,009.00	3066	22,122.00
Jun-23	12,785.00	2,650.00	15,890.00	3,800	35,125.00

Source: Uganda Railways Corporation (2024)



Northern corridor Volumes 
Central corridor volumes 

Table 8: an overview of the distances of these main trade lanes by lake transport.

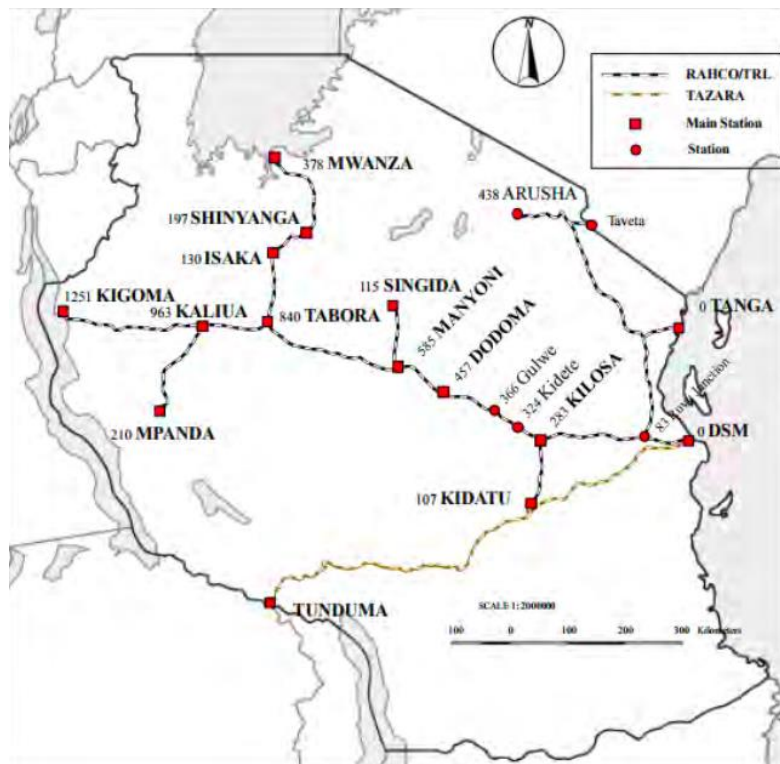
From To	Distance (Km)	Time (Hour)	Cost/ton (USD)
Port Bell to Mwanza	344	16 - 19	18
Port Bell to Kisumu	319	13 - 14	18
Jinja to Mwanza	355	16 - 19	22
Jinja to Kisumu	277	11 - 12	18

Source: URC, 2024

Table 9: Summary of Point-to-Point Cargo Services - Transport Options

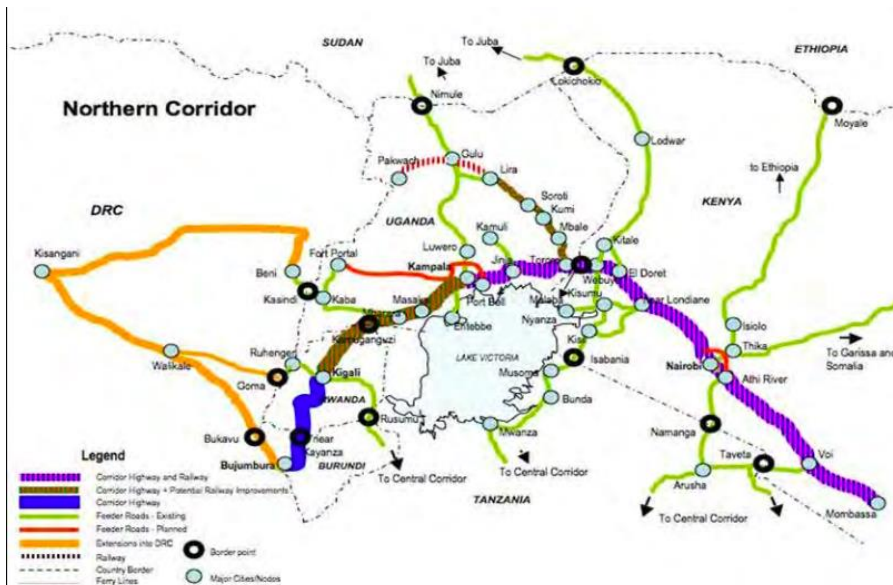
Transport System	Description	Current status
Rail Ferry	The transport system that was originally introduced during the EARHC period. The system entails using rail ferries that carry rail wagons across the lake, as an extension of the railway networks in Uganda, Tanzania, and Kenya.	Currently, all the 3 big vessels (Mv Uhuru, Pamba, Umoja and Kaawa) operating on the lake are rail ferries.
LoLo Barge and LoLo cargo vessel	The LoLo cargo vessel concept employs superstructures like cranes to lift containerized cargo on and off the vessel and provides a highly efficient and high-capacity way of cargo transport.	URC is planning of procuring a multi-purpose LoLo cargo vessel and this will serve ports (Bukasa, Mwanza and Kisumu) with modern infrastructure and handling equipment.
RoRo Barge and RoRo vessel	RoRo vessels can accommodate both unaccompanied and accompanied RoRo transport. In order to load/offload cargo, the RoRo vessels are equipped with ramps to facilitate loading and offloading operations.	Mahathi Infra U Limited is currently operating a self-propelled barge (MT Kabaka Mutebi II) of 450,000 MT to transport petroleum products across Lake Victoria from Kisumu, Kenya to Kawuku, Uganda Mv. Mpungu, a RoRo vessel with capacity to transport over 21 trucks between Portbell/Jinja and Mwanza.

Fig 3: Tanzania Railways Corporation (TRC) network



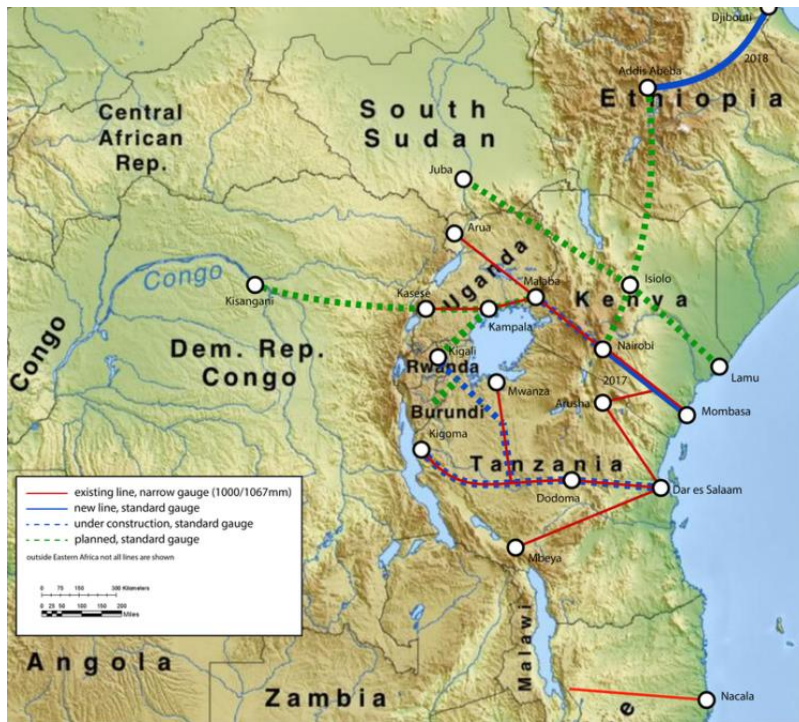
Source: Tanzania Railways Corporation

Fig 5: The Northern Corridor Network



Source: Northern Corridor Transit and Transport Coordination Authority

Fig 6: Current state of the EAC railway network



Source: The Atlas report, 2024

Fig 7: Lake Transport System Overview



Source: Lake Victoria Transport PPP Due Diligence Report, 2017.

Fig 8: Portbell Context



Port Bell lorry park area



Roll-on / roll-off ferry with railway tracks



Port Bell crane



Dry port area



Port Bell lorry park area



Roll-on / roll-off ferry with railway tracks

Source: URC

Fig 9: Artistic impression of Bukasa Port



Source: Gauff Consultants Uganda Ltd

Fig 10: Fuel storage tanks at Mahathi Infra



Source: Mahathi Infra

Figure 12: Point to Point Cargo Services - Assessed Services



Source: Lake Victoria Transport PPP Due Diligence Report, 2017

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